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### ORIGINAL COMMUNICATIONS.

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#### EFFECTS OF INDUSTRIAL STRAIN ON THE WORKING WOMAN.\*

BY

ROSALIE SLAUGHTER MORTON, M. D.,  
New York City.

IN reviewing the literature on hygiene of occupation I have been interested to observe that much of the most able and comprehensive work has been done by women, also that physicians have given much gratuitous time to an analytical study of this subject.†

What has been done shows the great desirability of the appointment under a National Department of Health of a Commission to make a systematic study of industries and their various forms of strain on normal women of different ages and types. Such a study would involve the detailed consideration of modifying factors which are necessary before accurate deductions can be made from statistics. For instance, present records show a high percentage of tuberculosis among both men and women working on tobacco. Unquestionably they are affected by the irritation of dust and fumes which render them susceptible to various derangements, especially bronchial catarrh, which lowers their resistance to tuberculosis, but on the other hand, stripping and sorting leaves, rolling stogies, etc., is not as strenuous as some other kinds of work; therefore many who already have tuberculosis seek employment in tobacco factories.

The data on a number of trades already available shows the

\* Read before the Section on Hygiene of Occupation of the International Congress on Hygiene and Demography, Washington, D. C., September. 26, 1912.

† See appended list of references.

value to the business and social welfare of the world, as well as to the individual, of wisely conducted industry, for it must be profitable both to the employer and the employee to become truly constructive to the State.

The regulation of work to an eight-hour day has proved necessary for men to retain their efficiency and such regulation of hours for women is equally necessary. Shorter hours and fairer pay would lessen the effects of industrial strain upon the working women both individually and eugenically to an extent which would raise the health and efficiency of our race at least 70 per cent. Factory and other nondomestic industry is not in itself a menace to women; in fact, in many instances a woman's physical and mental health are better when she is engaged in a regular and impersonal form of work.

Statistics from insane asylums and life insurance companies show that a higher percentage of insane come from the class of domestics and housewives than from women in trades and professions, and that longevity among women has increased during the last twenty-five years. Most of the women who break down from work do so from causes which are in no way related to sex. In gathering information for this paper, I found that the average temporary illnesses in three New York department stores show that the number of employees who seek relief in the hospitals located in the stores is divided between men and women in about equal ratio to those employed. Of the women patients approximately one-third suffer from headache, one-third from indigestion and miscellaneous ailments, and only one-third have menstrual disorders, which makes a very small proportion out of the total number of employees. For instance, in a store which employs 3000 women there will average not more than ten a day who come to the rest room or hospital for a few hours on account of dysmenorrhea. In one of the stores which employs approximately 3500 women, the nurse who had been in attendance for eight years said that she knew of only fifteen cases of permanent pelvic trouble brought on by work in the store. In one store which is situated at the junction of several surface and elevated street car lines, the daily attendance in the store hospital is double that of a store in a more quiet location. The ventilation of the former store is also poorer than in the latter. The proportion of those who suffer from dysmenorrhea is larger in the store which is not so well ventilated and which is noiser, showing that general hygiene has its effect upon a woman's health during

her period. A point which is often overlooked when statements are made regarding the endurance of women as a class, is that their lower wages do not enable them to purchase as sustaining food as men customarily have; for instance, the average amount paid by women in shops, factories and clerical positions for their lunch, is fifteen cents; the average paid by men in the same lines of work is thirty cents. The resulting lack of nutrition naturally in a very short time lessens the endurance of women workers. Among the 3800 employees in the head office of the Metropolitan Life Insurance Co., absences on account of illness have been conspicuously reduced since the company has provided a substantial lunch for employees, and a similar result has followed this wise economic step when taken by other employers.

On the general subject of hygiene in relation to industry many significant deductions may be made which apply to women workers in their homes, in colleges, in professions, in shops and in factories, showing that their endurance, capacity and output are influenced by mental and physical hygiene rather than by sex. The papers which have been or will be read before this Congress, direct intensive thought toward many details of industrial strain which are applicable as much to the working woman as to the working man; in fact, according to the schedules of the Twelfth Census in 1900, we find women in 295 out of 303 separate employments tabulated. The general headings given are: Agriculture, Professional Service, Domestic and Personal Service, Trade and Transportation, Manufacturing and Mechanical Pursuits. The eight employments in which no women are recorded are: (1) Soldiers of the United States, (2) Sailors of the United States, and (3) Marines of the United States, (4) Street car drivers, (though two women are reported as motormen), (5) Firemen (in the fire department), (6) Apprentices and helpers to roofers and slaters, (7) Helpers to steam-boiler makers and (8) Helpers to brass workers.

It may be of passing interest and perhaps surprise, to note that a limited number of women were registered in unusual occupations: Five women are employed as pilots; on steam railroads, five as baggagemen, thirty-one as brakemen, seven as conductors, thirty-five as engineers and firemen, and twenty-six as switchmen, yardmen, and flagmen; six women were reported as ship's carpenters, and as many as 181 were reported as blacksmiths, and 508 as machinists; eight as boiler makers; thirty-one as charcoal, coke and lime-burners, and eleven as well-borers.



The laws, or lack of them, for the protection of women's health and the occupation in which women suffer from lack of fresh air or proper light, too great heat or cold, speeding up, inhalation of irritating dust and gases, etc., and the effects of these various forms of industry, have been so comprehensively presented to you that anything I might say would be in a large part a repetition; therefore, I will confine my paper to the especial effect upon women of trades which involve prolonged and unnecessary standing, the pushing of heavy trucks from room to room, as in the larger canneries; the constant carrying of heavy weights as core makers in foundries who carry trays of sand cores weighing from 10 to 50 pounds from work benches to ovens; operating machinery by treadle pressure or incessantly kicking, as in a case cited by Dr. Caroline Hedger, where, in assembling screw drivers, a girl kicked 7000 times a day with one foot. Other work especially harmful to women is violent treadle pressure as in button stamping machines, perforating presses in binderies, and the laundry cuff press.

In order to push or carry a heavy weight it is necessary to forcibly inflate the lungs and rigidly fix the diaphragm. This increases intraabdominal tension and will eventually lead to prolapsus, anteversion, anteflexion, retroversion, or retroflexion of the uterus. The fatigue consequent upon continuous heavy muscular effort causes a relaxation of the ligaments which support the uterus, and as the organ is situated in the pelvis with the heavy end up, the force of gravity tends toward misplacement when the ligaments lack tone. The uterus is well balanced by the round and the broad ligaments on each side, the sacrouterine behind and the vesicouterine ligaments in front, and is to some extent supported by the vagina. According to the investigation of Elizabeth Beardsley Butler, in Pittsburg, Pa., 1907-1908, prolonged standing is customary in most departments of cracker factories, laundries, dyeing and cleaning establishments, metal works, lamp and glass factories, mirror, broom, cork, paper box, soap and trunk factories, in some press rooms and in most mercantile houses, this standing for long hours may tend toward uterine misplacements as indicated above. Then too, the fatigue of the nerves of the back bears directly upon the uterine nerve supply, which is derived from the second, third and fourth sacral (spinal) nerves, and from branches of hypogastric (sympathetic) plexus, and this not only causes local but reflex symptoms which impair the functions of other parts of the body.

Dr. Ely Van der Warker has called attention to the fact that the shape of the knee, the shallowness of the pelvis and the delicate construction of the foot of a woman, fit her inadequately for continuous standing for eight or ten hours. He calls attention to the "smallness of the patella and the narrowness of the articular surfaces of the tibia and femur. The lateral prominence of both bones are more developed in men, and therefore his knee-joint helps to form a more perfect sustaining column. In a woman the muscles which keep the body fixed upon the thighs in the erect position, labor under the disadvantage of shortness of purchase, owing to the short distance, compared to that of a man, between the crest of the ilium and the greater trochanter of the femur, thus giving to men a much larger purchase in the leverage existing between the trunk and the extremities, and comparatively, the woman's foot is less able to sustain weight than the man's, owing to its shortness and the more delicate formation of the tarsal and metatarsal bones." It must, however, be borne in mind that this is somewhat offset by the fact that the average weight of a woman's body is less than the average weight of a man's, and the feet of European and American women have increased in size with their greater use.

One of the primary drawbacks for women in conditions of work to-day is that most factories, etc., are equipped for the convenience of men workers. Mrs. Florence Kelly called my attention to the use in one instance of tables designed for men to sit at and used by girls fourteen years old who are thus obliged to stand absolutely needlessly.

Prolonged standing and excessive use of the legs, as in the manipulation of the treadle machines, has an effect upon the bones of the pelvis particularly in poorly nourished women between the ages of fourteen and twenty-five, as the bones are then not sufficiently hard to resist the mechanical effects of the extreme pressure. The pelvis forms a bony girdle which supports the weight of the rest of the body and is itself supported by the legs, the heads of the femurs fitting into the acetabuli, or concave sockets on each side of the pelvis. Constant standing causes this pressure to narrow the pelvis symmetrically. The incessant use of one limb may cause a lateral deformity which will render difficult or impossible an erect position of the body upon which depends to a large extent the health of every organ, because unless the lungs have sufficient room to expand they cannot aerate the blood and therefore a large portion of the waste

products of the body are not eliminated and oxygen is not supplied to the tissues of the body. The numerous occupations which, on the other hand, require the employee to be seated for hours in one position, have a deleterious effect upon a woman's health by tending to overdistended bladder, constipation, and pelvic congestion. The uterus is placed between the bladder and the lower end of the large intestine which passes above and back of the uterus, and the straining caused by difficult defecation, produces at least 50 per cent. of downward displacement of the uterus, with all its attendant discomfort and the frequent necessity of spending several weeks in the hospital. Constant overloading of the rectum causes pressure on many of the twenty-eight blood-vessels in the pelvis and interferes with the venous return of blood, thereby causing congestion and possible inflammation of the ovaries, Fallopian tubes, uterus and vagina, which means oftentimes invalidism, sterility, habitual miscarriages and life long misery. All occupations which cause the workers to become round shouldered are fundamentally injurious because the space for each organ in the body is so apportioned that the encroachment of one organ, or set of organs, upon others (as from faulty position of the bony structure) interferes with the functions of the organ pressed upon. The especial menace of any pelvic deformity is in its relation to pregnancy. Any narrowing of the pelvis interferes with the development of the child *in utero* and may necessitate an instrumental delivery, with the attendant risk of serious injury to both mother and child.

The health and vitality of the child from the time of conception depend very much upon the mother's physical condition, an unhealthy condition of her tissues may prevent a proper development and implantation of the placenta. A large number of miscarriages are due to this cause and later if she is overworked and poorly nourished, the nourishment of the child will be very much interfered with during gestation and lactation.

In a symposium of sex problems in relation to the health of working women it would be wrong, to omit mention of two very important factors which greatly reduce their health ratio, although these diseases are not due to industrial strain, and indeed the women themselves are often ignorant of having acquired them. Their working efficiency is frequently reduced as a result of their suffering from syphilis and gonorrhea and the economic effect of this is far reaching. The placenta under



ordinary circumstances acts as a filter and prevents the transmission of disease; for instance, a child of a tuberculous mother is not born with tuberculosis but a child may inherit syphilis from its mother or father. Unfortunately a large number of working women suffer from syphilis and gonorrhea which they do not recognize, and for which they therefore do not seek diagnosis and treatment.

In connection with the physical efficiency of women, a study of women athletes made in 1884 by Dr. Sarah E. Post and another recently made by Dr. Anganette Parry, are interesting.

She found that a "bare-back rider thirty-five years old who jumps through a hoop six times a minute, rode up to eighth month in one pregnancy, and a normal child was born at term weighing 9 pounds; in another pregnancy she also rode to the eighth month, and began riding again four weeks after the birth of this, her fourth child. The woman is in perfect physical condition." Another rider rode to the eighth month and later nursed her child. These women when asked whether they were exceptional cases said "no one ever heard of anyone breaking down in the business." Another who was also the mother of a rider, had six living children. A trapeze performer twenty-five years old has regular menstruation and no pain, flow stops while performing. A hippodrome acrobat; tumbler, and hand balancer—twenty-seven years old. Began training at five years, trapeze and rings. First menstruation at twelve; always regular; five days; moderate flow; no nausea or vomiting; no cramps; occasional headache. Flow does not stop while performing. Married at twenty. In the first pregnancy performed until fifth month; very easy labor, twelve hours. Second pregnancy; very easy labor, half an hour. After three months went back to the stage; plenty of milk.

"Mrs. H., father an American, mother an Indian, educated by missionaries in summer, the rest of the year followed the band of Indians. Married at twenty, trapped with husband, poles, tracks boat, handles ax, builds cabins, shoots, hunts, cooks, skilful in Indian woman's practical work, dressing animals, etc. Four healthy daughters in five years. Two younger ones born on the bank of the river, many degrees below zero, where she was entirely alone, and must keep fire, cook, etc. Passed through all successfully."

Dr. Parry pointed out that those women wore no heavy skirts and their training began in childhood and they undoubtedly have unusually strong uterine ligaments, they are very careful of personal hygiene and have plenty of air, wholesome food and work which they enjoy. A young woman recently swam across San Francisco Harbor, a distance of eight miles and on arrival was not fatigued. The feat has been accomplished but twice

before. These are exceptional cases and not especially to be recommended, for in both men and women an overtaxed, dilated heart leads to frequent fatty degeneration of the heart and muscles with increased age and discontinuance of vigorous athletics. Moderate regular exercise is necessary for continued good health, and the normal woman can attend to her ordinary duties during her menstrual period without injury, although on account of the uterus being physiologically heavy at that time, overexercise and vigorous exercise should be avoided the first three days of the period. Much has been written and said about nervous strain in women's work, and there are some occupations especially that of telephone operators, as pointed out in the "Investigation of Telephone Companies" (see Senate document No. 380), which call the special senses into play in a manner in which they are required to act not only continually but concertedly. This feature calls for special consideration in estimating the strain to which telephone operators are subjected by the nature of their work. "Connections at the switchboard are made by inserting a small plug in a small hole above which the number of the telephone requested appears. The eye is attracted in the first instance by the glowing of a light which announces the call. It has then to immediately find on the switchboard the hole in which it is necessary to insert the plug to make the desired connection. Similarly, in disconnecting, the eye detects the extinction of the light, and then seeks on the switchboard the number with which the connection has been made. This means constant employment of the muscles of the eye in different directions, and use of the optic nerve. The ear, in receiving calls, is required to distinguish between a multitude of different voices, to ascertain at once, and so to avoid repetition, the number asked for, no matter how indistinctly or ill pronounced the number may be; this necessitates constant alertness of the auditory nerve, while the vocal organs are scarcely less constantly in use in answering the calls, the repetition of numbers, and the conducting of such conversations as may be necessary. The sensations created by the working of the several senses in this manner transmit their several messages to the brain, which in turn, directs and governs the actions they suggest."

These special senses are also called into play simultaneously in stenography, typewriting, and telegraphy, but to a less extent than in telephone operating. These forms of work are well adapted to women psychologically and physically, but hours of

employment should be shorter than in other forms of work which are less expert and taxing to the nervous system. The report of the "Royal Commission of Canada on Telephone Companies" presents a study of special value.\*

The increase of nervous prostration among both men and women is perhaps the most important effect of strain which we have to consider, for all muscular and intellectual effort requires the expenditure of nervous energy, and overlong working hours wholly exhaust the sources of nerve endurance. Nerve cells are the producers of energy, nerve fibers conduct this to the muscles. Stimulation is wholesome—overstimulation produces an accumulation of waste products which acts as a definite poison and demonstrable changes take place in the cells of the brain and spinal cord. Miss Josephine Goldmark has made a comprehensive study and compiled much valuable data in her book on "Fatigue and Efficiency," which forms an unanswerable argument for shorter hours of work, for both women and men.

The measure of pleasure one finds in work markedly affects the amount of strain, as is well illustrated by the fact that work which accomplishes its object well is less fatiguing than the same amount of energy spent on work in which one is not interested or which results in failure.

The training of women in salesmanship by Mrs. Lucinda W. Prince in the Woman's Educational and Industrial Union in Boston, shows the value of educating the saleswoman so that her brain and physical force work together, giving her a sense of responsibility in regard to her work as a vocation, with intelligent interest in system, attention to details, increased knowledge of the goods to be sold, color, design, textiles, etc. Pupils sent from five well-known Boston department stores receive full wages while taking the three months course, which occupies them each morning. The value of this as a business proposition, as well as an illustration of the increase in efficiency with the lessening of strain, is shown by the fact that their afternoon sales give them a weekly total as high as employees who do not attend the school and who work all day.

In summarizing the direct effects of industrial strain on the working woman, it is my opinion, after consulting statistics compiled by many investigators, boards, institutions, companies, colleges, etc., and after conferring with a number of the thought-

\* In the discussion it was pointed out that the high-up reach and far-side reach were so fatiguing that switchboards are now made smaller than formerly.

ful people who have opportunities to observe women who work under varied conditions, that with properly regulated hours of work and recreation, outside of the excessive physical labor to which I have referred in this paper, women may work in practically any field of modern industry, and not only retain but increase their standard of health, if they are given hygienic and properly arranged buildings in which to work, and if they and their employers are taught the common sense of the laws of health. This education is the great need—for legislatures must pass laws protecting the health of laborers when they and their constituents really comprehend that the health of its citizens is the greatest asset of any nation, and this will occur when a greater number of their constituents are interested in the health of women of all classes. Without education good laws may be inactive, for instances in six states, Massachusetts, Maryland, California, Wisconsin, Illinois, and New York, we have laws providing for seats behind the counter for saleswomen, which, however, they are prevented from using by the disapproving watchfulness of a floor walker who is ignorant of the relation of fatigue to inefficiency.

When individuals are educated to understand that their happiness and continued usefulness depend upon personal as well as industrial hygiene, there will be a fulness of joy in living which is a perfectly practical standard for the attainment of which the world's best citizens are working.

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## PROGRESS OF THE YEAR IN OBSTETRICS.\*

BY

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### PUBIOTOMY.

DURING the past year or two, many operations have been performed and statistics are numerous.

De Lee(1), speaking of 300 cases operated upon in the last two years, states that the maternal mortality has been reduced from 4.3 in a preceding large series of cases, to 1.7 per cent., while the fetal mortality has been reduced from 9 to about 4 per cent. Injuries to the soft parts have also materially decreased.

Jacobson(2) found that up to January, 1912, there had been fifty-three pubiotomies in this country, thirty-nine of which were primary or elective, and fourteen secondary, following attempted forceps delivery. There was no maternal mortality in the primary cases, but he found 22 per cent. mortality in the secondary cases. The fetal mortality in the primary cases was 10 per cent., in the secondary 56 per cent. He himself reported ten operations, with no maternal mortality, and 30 per cent. fetal.

\* Read before the Society of the Alumni of the Sloane Hospital for Women, Oct. 25, 1912, and the New York Medical Union, Nov. 26, 1912.



Roth(3) presents some interesting statistics of eighty-five operations in the Dresden clinic. His maternal mortality was 2.35 per cent. and the fetal mortality was 7 per cent. The high morbidity of the series is indicated by the following: There was severe bleeding in thirteen, very severe in three, severe injuries to the soft parts in fifteen (17 per cent.); communicating vaginal tears in ten (29 per cent. in primiparæ, 9.8 per cent. in multiparæ); eight bladder injuries in primiparæ (23 per cent.); four bladder injuries in multiparæ (7.8 per cent.). Of the eighty-five, 56 per cent. had temperature in the puerperium, 23 per cent. of which were severe cases. *Thirty-eight women were examined subsequently, and ten of these complained of difficulty in walking and inability to perform their work.* These results have led him to exclude the operation in primiparæ.

In comparing the operation with Cesarean section, he mentions the following disadvantages in pubiotomy: 1. That operative delivery must follow pubic section; 2. that hemorrhage is often severe; 3. thrombosis is more common; 4. fetal mortality is higher; 5. there is greater disturbance in walking. He concludes *that the operation should be limited to clean cases, in multiparæ, with the cervix fully dilated, where an attempt has been made to extract with forceps, and where there is only moderate disproportion.* With reference to subsequent labors, after pubiotomy. Deus(4) collected seventeen cases from the Charité Clinic in Berlin, and thirty-three from the literature, making fifty in all, in which, after pubiotomy, subsequent labors were terminated by forceps or version. The chief deduction appears to be that after these fifty operations, the pelvic enlargement remained permanent to the extent that delivery could occur through the natural passages, if aided by forceps or version. He then mentions sixteen cases from the literature and two from the Berlin clinic, in which pubiotomy was performed more than once. He concludes that it cannot be denied that pubiotomy can favorably influence subsequent labor, either by an actual enlargement of the pelvis, or by an increase of size during the labor, the latter being more commonly observed.

Van de Velde(5) compiled records of 124 cases of labor subsequent to pubiotomy and found that of this number seventy-five had labors either spontaneous, or the equivalent twenty-six either went through a second hebstomy, craniotomy or Cesarean section, while in the remainder of the number, data were insufficient.

## PITUITARY EXTRACT.

During the past year this therapeutic agent has been used many times, and we may well devote our attention to some of the clinical reports which have been presented.

Hofbauer(6) has collected notes from sixty-six cases in Winter's clinic at Königsberg.

Speaking of dosage, he says that there is no doubt that in many cases,  $1\frac{1}{2}$  c.c. will have the desired result. The unit dose in the last forty cases has been 1 c.c. If ten minutes after injecting this amount no pains, or only weak or brief pains set in, the dose is repeated. In only rare instances has a third dose been necessary. Animal experimentation has shown that there is practically no toxicology. The pains are usually rhythmic and may commence three minutes after the injection, or, at the latest, eight to ten minutes. The duration of the contraction varies from thirty seconds to three minutes. There may first be a prolonged tonic contraction, but the subsequent pains are regular. Hofbauer states that it is in the expulsive period that the results are most marked, but he cannot recommend its use for postpartum hemorrhage. The author has carefully noted the fetal heart in labor, and he believes that the drug will not cause asphyxia. He concludes by stating that pituitary extract has already won a permanent position in obstetrics.

Aubert(7) used the remedy in forty-two cases in the Geneva Maternity. He used the extract at the end of the first stage, and he states that 2 c.c. were sufficient in thirty-seven of the forty-two cases, there being at times a true "resurrection" of labor.

Benthin(8) states that in pregnancy, while pains may be excited, there will not be progressive dilatation of the cervix. Used in the expulsive period, it is a valuable remedy rendering the use of forceps in many cases unnecessary.

Nagy(9) believes that the extract gives excellent results in the postpartum period and in atony after labor. He states that not infrequently the pains succeed each other in stormy fashion, and relaxation is incomplete in the intervals between pains. Soon, however, the contractions become regular. The author has often noted a diminution in frequency of the fetal heart, and in one case when the child's head was low in the pelvis, the fetal heart became weak, and he was obliged to extract rapidly with forceps. The child was deeply asphyxiated

and could not be resuscitated. Whether the extract was responsible, is of course unknown. He believes however that the remedy should not be used if the fetal heart is already weak.

Fries reports from Kroemer's Greifswald clinic, that the remedy has been tested in seventy-five cases, and he believes it to be a dependable and harmless oxytocic, which does good work in both the first and second stages of labor.

In the after-birth period, its action is uncertain and inferior to ergot.

Roemer(10) states that the drug fails to excite labor, or to hasten the first stage, but that excellent results are obtained where the pains are weak, and the cervix is widely dilated. The drug is harmless in proper dosage. He used the extract in seventeen cases, ten of which ended spontaneously, and in two of the seven cases terminated by forceps, the operation was demanded by poor fetal heart sounds.

Grünbaum(11) reports excellent results in sixty-five cases, and believes that the use of the extract marks a great advance in conservative midwifery. He also remarks that inert specimens will naturally give poor results.

Patek(12) speaks of the extract in abortions, and states that continued use of the preparation in abortion therapy has shown that we are often in position to terminate abortion spontaneously provided the cervical canal is open and pains, however insignificant are present. These abortions occurred between the third and sixth months, and were attended by hemorrhage, the cervical canal admitting at least one finger. Even after the first injection violent pains almost always set in, and if the first failed the second succeeded. In some cases the extract was injected into the veins. No collapse followed, as reported by Schäfer. The mode of injection—whether subcutaneous, intramuscular or intravenous—did not appear to modify the result.

As a rule the hemorrhage increased after the injection, so that in certain cases it was necessary to tampon the vagina. This not only checked the hemorrhage but strengthened the pains. In a series of these cases the ovum was expelled in from thirty minutes to four hours. In most cases the placenta was expelled intact. In a few it was necessary to remove portions mechanically. There were no cases of portpartum hemorrhage.

There were, however, three cases (the subject of the paper) in which the extract appeared to produce an unusual result. *This*

*was no other than arrest of labor and continuation of pregnancy after abortion was well under way.* The extract is known as a rule to produce a uterine contraction which is not at all *tetanic*. Yet Rieck has reported a case of the latter in which the uterus remained contracted. Hamm saw several cases of tetanic contraction of the uterus and Mackenrodt reported a case of severe tetanus uteri in a strong primipara at term resulting in death of the fetus.

Tetanus has also been seen by other observers. Of more value for us is a case of Mackenrodt's like those of the author's. In artificial premature delivery, the cervix having been dilated to three or four fingers with a balloon, large doses of pituitrin were given. The balloon was expelled, the cervix closed up, and the pregnancy continued. In speculating on the occasional appearance of tetanus uteri the author thinks this due to some foreign component, probably derived from the anterior lobe of the hypophysis. Experiments should be instituted to settle this point.

E. Hauch and L. Meyer(13) state that the extract seems to be generally effectual in inducing contraction of the uterus at term and expulsion of the fetus, and it may render forceps delivery unnecessary. Its action before term is uncertain. They obtained such good results with it in four cases of partial placenta previa that they think it may prove of great assistance in such cases, as it aids in arresting the tendency to hemorrhage. Brammer reports his experience with it in twelve cases of which he gives the details. He says that when all goes well the obstetrician feels that his dreams are being realized, but that the action of the extract is irregular and it may induce such violent contractions as to endanger the fetus. The contractions may become so violent that a little chloroform may be needed. These and other reasons make it necessary for the physician to remain with the patient for at least an hour afterward. The only contraindications seem to be an abnormally high blood pressure from arteriosclerosis or nephritis, and possibly a tendency to nervousness or hysteria as these may magnify the influence on the uterus and lead to too violent contractions.

Fischer(14) at the Würzburg clinic gave the extract during labor to strengthen the pains in thirty cases. In twenty-four of these the extract was given during the first stage and in six in the second stage. The results are given in a table. The author states that the *further advanced the labor at the time of*

*first injection the better the action of the drug. The shortening of all the stages of labor was marked. Postpartum hemorrhage was not prevented* and seems to have been frequent as nine cases are mentioned. Most of these were of moderate severity. As a rule the hemorrhage followed promptly after expulsion of the placenta. In the nine cases the pains had been strong, with tendency to relax between. In two cases hemorrhage occurred before expulsion and the latter had to be effected manually.

Humpstone(15) quotes Bondy, Gottfried and others in the literature, who had excellent results. He has used the extract in sixty-four cases, giving 0.4 gram (4 c.c. of the Parke Davis preparation) as the initial dose, intramuscularly, and repeats every twenty minutes if necessary for three doses, then stops if there are no results. For induction of labor, results are negative, but in the latter part of the first stage and in the second stage where there is inertia, brilliant results can be obtained. He believes that the remedy has a definite place in obstetric therapeutics, and is chiefly indicated in inertia uteri, postpartum hemorrhage, Cesarean section, and in the prevention and treatment of shock. He has never seen an unhappy result in mother or child, and believes there is no toxicity with any dose.

We have ourselves exhibited the extract in a number of instances, with astonishingly good results in some cases. It is marvelous to note the change from weak inefficient contractions to strong hard rhythmic pains. The extract may be most conveniently obtained in the form of vaporoles or ampoules each containing 1 c.c., from the Burroughs, Welcome Co. and Parke, Davis & Co.

#### EXTRAPERITONEAL CESAREAN SECTION.

Küstner(16) has operated seventy-two times in all, almost exclusively in contracted pelvis and has lost but four children, although in many cases operation was only undertaken when death was impending. In one-half the cases infection was either present or suspected. No patient was lost from infection. One death occurred from the anesthetic. A principal advantage is the easy convalescence. There were *six cases of injury to the bladder*. There have been no craniotomies at the clinic since the operation was first adopted.

Acconci(17) summarizes all accessible cases to date, the individual operators being given in chronological order. Nearly

eighty men have reported cases, but naturally the majority have operated but few times. The heavy operators are Frank (pioneer), forty-six; Sellheim, forty-six; Baumm, forty; Küstner, fifty-five; Baisch, fifty; Küster, sixty; Bumm, thirty-two, and Pankow, thirty-nine. No other operator has yet reached twenty-five. The principal operating has been done in Germany, and not a single case is credited to the United States.

Of the 670 women operated upon, thirty-seven (5.5 per cent.) died (twenty-seven from sepsis). Of the infants thirty-eight died (5.5 per cent.), seventeen, or 2.5 per cent., from causes inherent to the operation.

Baisch(18) reports that at the Munich clinic fifty of these operations have now been performed. The aim was always to avoid the opening of the peritoneal cavity but in three cases this was impossible. In one case the fold was too deep and a transperitoneal operation was done. In another the uterine incision bled so that an intraperitoneal operation was done. In a third it was necessary to extirpate the uterus for hemorrhage.

Three of the fifty mothers died, from eclampsia, sepsis and paralytic ileus respectively. The number of children lost was six. One was undeveloped and in four the infants had been injured by attempts at extraction.

With the extraperitoneal operation we can attack cases in which the classic operation and hebstomy could not be performed for fear of infection. The extraperitoneal route is suited for the wide region of the suspected infection cases in which fever is not present.

The author prefers the incision in the linea alba as giving the best and most convenient access to the uterus and peritoneal fold. One cuts down to the parietal peritoneum, forces the recti apart and pushes the partly filled bladder to left or right. The fold is usually easily perceived. This is forced upward as high as possible, the bladder still to one side, and the uterus then opened exactly in the middle line.

It is objected that the children are in greater danger. To this and other objections the answer is that with perfect technic there should be no necessary risk.

Litchkuss(19) discusses the course of gestation and labor after extraperitoneal Cesarean section. As a shadow side of extraperitoneal Cesarean section is, as is well known, the dangerous situation of the cicatrix in the uterus which in a subsequent labor may give way, another unfavorable aspect is the dis-



placement which may result after the operation (retroflexion), which may prejudice a new gestation. Fortunately up to date there has been *no report of a rupture in the scar*, although this *accident has been predicted by Schauta* and other Vienna authorities.

Very recently Hartmann reported eight labors after extraperitoneal section. In two labor was premature and spontaneous, while in the other six the operation had to be repeated (once in four, twice in two). The course of gestation was not disturbed and not once did the much-dreaded retroflexion develop. The cicatrices were firm throughout.

In 1910 the present author reported four cases in which labor occurred after previous extraperitoneal section. In three cases the operation had to be repeated, while in the other the fetus was perforated and extracted.

Sellheim has now operated forty-six times and five of his women became pregnant afterward. Gestation went ahead without trouble. In two women with contracted pelvis extraperitoneal. Cesarean section was done. The others were delivered by the natural passages. Sellheim found the repetition of the operation *more severe* than its first performance.

Veit repeatedly examined the scars of the extraperitoneal operation and found them durable in subsequent labors.

The author now reports in detail two more cases of labor after extraperitoneal operation. He sterilized one patient while operating by the classic method, by agreement made before intervention. The change of operation was due to formation of adhesions about the cervix and probably to the increased difficulty of second operations. The other patient was left to natural forces for similar reasons, and the child was stillborn.

Polano(20) states that the extraperitoneal section has the advantage of isolating the peritoneal cavity and also of being lower down in the uterus. There are three severe drawbacks: 1. The technic is more difficult; 2. there is a greater loss of blood because the vessels cannot be compressed, and 3. it is more difficult to take out the fetus. In order to obtain the advantages of the extraperitoneal operation without its drawbacks the author proposes to open the posterior wall of the uterus at its lowest point, with drainage from the most dependent portion of this incision. This of course requires a large abdominal incision. The uterus is then turned out through the opening and bent strongly toward the symphysis. It is now easy to control

hemorrhage, and to incise the posterior aspect of the cervix and extract the child.

The author has thus far operated in four cases. To repeat his technic in detail in one case: He injected 2 c.c. sol. ergotin, made incision from symphysis to three fingers' breadths above the umbilicus, rolled out the uterus, bent it over the symphysis to the utmost and split the posterior aspect of the cervix sagittally into the inferior segment. The waters were allowed to escape and the head being the dependent portion of the fetus, the latter was easily extracted. The placenta was delivered by traction and pressure. As the uterus was atonic, clamps were used to prevent hemorrhage and the cervical wound readily and cleanly sutured with three planes. In two of his cases he drained into the vagina with rubber drains. Of the four cases, all recovered except one child, carried in one horn of a double uterus.

#### HALF NARCOSIS IN LABOR WITH SCOPOLAMIN AND OTHER DRUGS.

Zweifel(21) has used morphine, pantopon, morphine and pantopon combined, narcophin, narcophin and morphine combined, in connection with scopolamin, for obstetrical narcosis. Good results were obtained from all the combinations.

In 500 labors under these narcotics 85 per cent. experienced a satisfactory abolition of pain. Gauss obtained almost the same figures. In 157 (31 per cent.) there was no recollection of the birth of the child. Pantopon scopolamin seemed superior to morphine scopolamine. There was more analgesia, less deep sleep, and not so frequent amnesia. There were no noteworthy collateral phenomena or sequelæ nor was there any apparent interference with labor. There was but one infant death which could have been in any way imputed to the narcosis (there is no mention of the number of children, if any, who required resuscitation). The author endorses the method in obstetrics with limitations.

#### BIOLOGIC DIAGNOSIS OF PREGNANCY.

Frank and Heimann(22) states that Abderhalden has devised simple and certain tests for pregnancy, based on the fact that certain albumins not necessarily from alien blood cause the formation in the blood of a given subject of ferments which in turn cause the formation of cleavage products susceptible of identification.

The method of dialysis is based on the fact that while albumin, being colloidal, is not dialyzable, its crystallin cleavage products pass through the membrane. Let pieces of placenta represent the source of the supposed alien blood; add to these the blood serum of the test subject. Dialyze this against distilled water, and then test the latter for the presence of disintegration products due to the action of ferments generated by the contact of the placenta albumin with the blood albumin. The chemical reagents used for the test consist of soda lye and a solution of sulphate of copper. The copper is precipitated in any case as a blue ring of the hydrated oxide; but if the cleavage has taken place a second red-violet ring appears.

The serum of a gravida will produce this reaction *in every instance*, with placenta albumin or placenta peptone, which may be kept on hand for the tests. The blood of a nongravid woman when tested with placenta reacts negatively.

The principle once discovered, it remains to test it exhaustively for its conditions of activity and especially to exclude all sources of fallacy. In theory the test should be obtained as early as fourteen days after conception because chorionic villi date from that period. The present authors began to study the earliest pregnancies, when diagnosis would have the greatest value. They examined thirty-three women whose menses after having been perfectly regular had ceased without apparent cause other than physiologic. A few women had passed two months. The cases were of the type in which the obstetrician usually postpones his opinion for a month. The physical signs were doubtful. In a number of cases the uterus was enlarged, Hegar's sign positive. The positive and negative tests were not wholly in accord with the facts as subsequently developed. Two nongravidaë gave positive finds, but in no case did a gravida react negatively. One month later twenty-three of the women were tested a gain and the findings were absolutely correct. The two cases of false positive reaction mentioned were doubtless due to a perforation in the membrane or of some other technical shortcoming.

#### INDUCTION OF LABOR WITH FETAL SERUM.

The *Journal of the American Medical Association* in a recent issue states that stimulated by an editorial in its columns commenting on the work of Heide in causing the onset of labor by injection of fetal serum, Rongy had repeated the work of

Heide and in a report of nineteen cases adds to the interest and information in regard to this subject. In six patients injected with small quantities of fetal serum, prepared after the method suggested by Heide, ten to eighteen days before term, expulsion of the child followed promptly. In all cases, uterine contractions were observed by Rongy soon after the injection of the serum, although no pains were felt by the patient. It was determined that pains were felt only when there was direct stimulation of the cervix by the pressure of the bag of waters and the oncoming head. In two cases it was found that whereas injection of a large dose produced reaction promptly, injection of 5 to 7 c.c. followed by a large injection of 20-25 c.c. four to five hours later gave a more severe reaction. In two cases of inertia uteri, the serum was very effectual and injection was followed by active labor pains within a short time after injection. Finally in a case of threatened eclampsia, injection of serum induced labor and all urinary symptoms cleared up immediately after the first injection. In seven cases negative results were obtained, in four of these there were precordial pain and oppression, in practically all some nausea and vomiting, and in two slight pains which may or may not have been induced by the serum. These results appear distinctly encouraging. The work of Heide has been corroborated and we have reason to believe that fetal serum does contain substances that may cause the onset of labor. An interesting field has been opened for further investigation. The exact nature of these substances, their mode of action and their rôle in causing the natural onset of labor are some of the problems to be solved.

#### VACCINE THERAPY.

The writer regrets that lack of time has prevented a search of the literature in progress along this line, but he believes that the subject is yet in its infancy. That therein lies our hope in the successful treatment of sepsis, is evident from the large number of excellent reports from many observers. In the author's experience streptococcus bacteremia has proved almost invariably fatal, regardless of treatment, but in the less severe conditions, there can be no doubt that vaccine therapy will prove to be more and more valuable, as time progresses and we learn from extended experience the indications for the use of vaccines and the dosage. There is no more promising field for investigation than this.

## ECLAMPSIA.

There is still a very wide divergence of opinion in regard to the treatment of eclampsia. The conservative treatment of Stroganoff has been extensively followed abroad, Stroganoff claiming a mortality in his own 400 cases of only 6.6 per cent. When the method has not been strictly applied, the mortality ranged from 9 to 12 per cent.

Lichtenstein(23) states that eighteen German obstetricians have reported 955 cases of postpartum eclampsia, or more than 20 per cent. of the total number of cases. He cites this among other arguments as speaking against the advisability of premature delivery as a therapeutic measure in eclampsia. He states that at the maternity at Leipsic in charge of Zweifel, expectant treatment has been the rule for the past year.

Steiger(24) compares the statistics reported at the recent International Gynecologic Congress, showing that none of the speakers has had such a low mortality as Stroganoff. At Dublin the mortality was 9.09 per cent. in sixty-six cases. The principle is to keep the metabolic processes down to a minimum; promote elimination of fluids and toxins through the kidneys; clear out the gastrointestinal tract and extract the fetus when the soft parts are sufficiently dilated, *not before*. Forcible delivery is *not* advisable. At Dublin, Tweedy modifies the technic by using morphine and atropin in place of chloroform and chloral.

Stroganoff(25) himself cites Roth's experience in the old Leopold clinic at Dresden. Fifty cases were treated with Stroganoff's method, with but 8 per cent. mortality and 12.8 per cent. infant mortality. There have now been sixty-one cases treated in Germany with a maternal mortality of 6.5 per cent. and infant mortality of 18 per cent. He claims that the combined material of all reporters now amounts to 660 cases, in which the maternal mortality is not quite 8 per cent. and the infant mortality 21 per cent. No doubt the former could be cut down to 6 per cent. if we leave out the cases which are doomed in advance.

These figures certainly compare most favorably, for example, with the statistics of Freund (*Arch. f. Gynäk.*, 1912, xcvi) who reports results in 551 cases at the Charité Hospital in Berlin. The maternal mortality in these cases was 17.2 per cent. The treatment there consisted of evacuation of the uterus as the earliest possible movement and by the most rapid methods.



On the other hand, Voigts(26) reports sixteen cases treated at Bumm's Berlin clinic. The cases were all of the severe type, and the results with the Stroganoff treatment were very unfavorable, as, excluding two deaths from sepsis, the mortality was 31.2 per cent.; infant mortality 37.5 per cent.

Voigts claims that the regular maternal mortality at the clinic is but 15.4 per cent., and the fetal death rate 30.8 per cent.

In this country there are a number of strong advocates of vaginal Cesarean section for eclampsia, among them Peterson and Polak. The former claims that maternal and fetal mortalities are lower, the earlier the uterus is emptied after the first convulsion in antepartum eclampsia. Vaginal Cesarean section meets all requirements, and Peterson claims that the technic can be acquired by anyone familiar with the rudiments of obstetric surgery. Abdominal Cesarean section has been attended by a very high mortality rate (49 per cent. in 116 cases) while Peterson reports in 530 cases of vaginal operation, taken from the literature a mortality of 21.2 per cent.

Personally we believe that the vaginal or abdominal operation should be reserved for those cases in which the cervix fails to dilate after a fair trial with the de Ribes bag. Certainly in the hands of the surgically unskilled, and especially in the absence of proper hospital facilities, the conservative plan of treatment will give infinitely better results.

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- 144 WEST FIFTY-EIGHTH STREET.

## BOUGIE REMOVED FROM THE ABDOMEN TEN WEEKS AFTER INTRODUCTION PER VAGINAM.\*

BY

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THE following case is reported, not with the idea of illustrating any new pathological discoveries or methods of treatment, but because it is of interest as a matter of curiosity and also permits of interesting speculation and discussion.

Mrs. N. C., age twenty-six, born in the United States, the mother of three children, was admitted to Bellevue Hospital, August 13, 1912, complaining of a tender, painful mass in the abdominal wall over the outer edge of the right rectus muscle on a level with the umbilicus. This had been present for one week and was gradually increasing in size. She said that she had fallen and struck herself on a chair over this area about two months previously.

One year ago she became pregnant and an abortion was induced by a midwife, by means of the introduction of a lisle thread bougie. The midwife then presented her with the bougie for personal use in case it became necessary at a future time.

Ten weeks before admission to the hospital, she had gone two weeks over her time for menstruation, and attempted to induce an abortion by introducing the bougie into the uterus. After passing the bougie, which did not cause very much pain, she inserted a tampon of cotton in the vagina to keep it in place. Some hours later on going to the toilet the cotton came out, and she said that she thought the bougie came with it. She saw the cotton in the closet but not the bougie.

Physical examination showed an indurated, red, edematous, slightly tender area about 8 centimeters in diameter, in the abdominal wall over the outer edge of the right rectus muscle, its center being slightly above the level of the umbilicus. The

\* Read before the Alumni Society of the Sloane Hospital for Women, October, 25, 1912.

patient presented all the signs of a three months' pregnancy. The temperature was 99.6° F., pulse 104, respiration 22. The leukocyte count was 14,800, with 78 per cent. of polynuclear cells. The urine was normal.

A vertical incision about 7.5 centimeters long was made over the indurated area, and after passing through the abdominal wall, an abscess cavity, well walled off by adhesions, apparently just underneath the peritoneum was opened and about 2 ounces of pus, smelling strongly of colon bacillus infection evacuated. On introducing the fingers into the abscess cavity, a lisle thread bougie 30 centimeters long was found curled up in the cavity and removed. The abscess cavity was drained with rubber dam.

The day following the operation there was a small amount of bleeding from the vagina, but this stopped in twenty-four hours and vaginal examination the next day showed no softening of the cervix or signs of impending abortion, but on August 24, eleven days after the operation, the patient had considerable bloody discharge from the vagina and complained of pain over the lower abdomen, and the following day aborted—a three months' fetus coming away. She was transferred to the gynecological service where she was cureted and discharged cured with her incision healed seven days later.

The points of particular interest in this case are: (1) The fact that the bougie was passed either through the uterine wall or perhaps the vaginal vault without causing a general peritonitis and then caused a local peritonitis nine weeks later; (2) that if the bougie passed through the uterus it did not cause an abortion at that time, while more than ten weeks later when it was removed from the abdominal cavity, slight vaginal bleeding occurred, to be followed ten days afterward by an abortion.

The first fact may perhaps be explained by the possibility that the bougie passed through the cervix or uterus between the layers of the broad ligament and worked its way up extra-peritoneally under the abdominal wall, but the pus in the abscess cavity was of colon bacillus origin, and this is improbable. But then it is also improbable that a bougie could work its way between several coils of intestine and not cause peritonitis.

The second fact may be explained by the passage of the bougie through the uterus without rupture of the amnionic sac and the later abortion caused perhaps by the end of the bougie remaining caught in the uterine wall; being pulled loose at the time of its removal from the abscess cavity, starting some bleeding with the resulting abortion twelve days later. However, none of these theories can be proven, and must remain a matter of rather interesting conjecture.

## THE DIAGNOSIS OF EXTRAUTERINE PREGNANCY.\*

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PERHAPS one should apologize for bringing before you a theme so frequently discussed, but my excuses are twofold. First, mistakes are constantly being made in the diagnosis of extrauterine pregnancy, both as to omission and commission; second, there are those who assert that the diagnosis of this condition is always easy. The latter thesis I deny categorically. I know of no diagnosis in the realm of gynecological diseases which is at times more difficult to make. For instance, in the last ten cases of extrauterine pregnancy admitted to the first gynecological service of Mt. Sinai Hospital (Dr. Brettauer's service), four were incorrectly diagnosed in the hospital. One was mistaken for an incomplete abortion, another for a small ovarian cyst, a third for a hydrosalpinx and the fourth for a pyosalpinx. Errors on the other side are by no means infrequent. Thus, this summer, a patient was admitted with a history of irregular menstruation, hemoglobin of 30, temperature of 103° F., and a pulse of 130. She said she had been ill only twenty-four hours. The uterus was slightly enlarged, she had a dark bloody discharge and a mass was felt on the left side near the uterus. A diagnosis of extrauterine pregnancy was made and immediate operation was performed. A pyosalpinx was found and removed—contrary to our usual custom in acute cases. The patient died the same night. At the autopsy, the anterior wall of the uterus and the entire endometrium were found to be gangrenous and a streptococcus peritonitis was present. We subsequently learned that she was the victim of a criminal abortion.

If errors of this kind are not uncommon in hospital practice, where patients are subjected to the close scrutiny and study of many physicians, they are no less common in general practice. This then is my excuse in bringing the subject before you for discussion.

\*Read before the Alumni Society of the Sloane Hospital for Women, October 25, 1912.

My paper is based upon a study of 130 cases from Dr. Brett-auer's service; the first thirty were reported by me, the next fifty by Frank and the last fifty are included in this paper.

It has been said by some writers that previous inflammatory disease of the pelvis is a factor in bringing about a pregnancy outside of the uterus. This has never been proven to my satisfaction and, in fact, many of our cases occurred in tubes which showed no other evidence of disease. Indeed, extrauterine nidation of the ovum has been known to occur after the first act of coitus. Nor should a previous history of sterility be permitted to weigh in favor of a diagnosis of extrauterine pregnancy; for if there has been a period of sterility, it is likely that its cause is the same as that of the development of the abnormal pregnancy. It is probable that not one, but several elements enter into the causes of extrauterine pregnancy, including gonorrhea, abnormalities of the tube, pelvic disease with the destruction of the tubal ciliæ, and possibly, Webster may be correct in assigning atavistic tendencies as one of the main causes of this abnormality. But whatever the cause or causes, one must not permit himself to be led astray by any one fact in the patient's history.

There are three symptoms which usually point the way to an extrauterine pregnancy: 1 and 2. A certain period of amenorrhea combined with irregular uterine bleeding. 3. Abdominal pain.

1 and 2. *Amenorrhea and Irregular Bleeding*.—The amenorrhea may be a relatively unimportant factor in the history, for only a little over 50 per cent. of our patients had missed a period. In many of them the menstrual history was not easy to obtain but the fact remains that in many cases of extrauterine pregnancy there is no intermission of the regular monthly flow. We have had several cases of tubal abortion and tubal rupture in which the periods had been regular. We have at present in our ward a young girl whose first sign of any abnormal pelvic condition was the rupture of her pregnant tube. In general, however, there is a history of irregularity. Crudely put, the history usually involves the statement that the patient was a few days or a week or two overdue, with some spotting or bleeding before the expected arrival of the next regular period. Every variation can be found. One patient will have had no irregular bleeding at all while another will complain of profuse bleeding. But profuse bleeding in ectopic pregnancy is the exception and its presence points rather to the interruption of an intrauterine



pregnancy. It occasionally does occur but spotting or scant bleeding is the rule.

The cause of the uterine bleeding is of some interest. Cazeaux believes that the varying congestion of the uterus is responsible for the hemorrhage and for its appearance at irregular times. It is probable, too, that the casting off of the uterine decidua has some bearing on the metrorrhagia.

3. *Abdominal Pain*.—This is one of the most characteristic symptoms of extrauterine pregnancy and almost every patient complains of it. It may be constant or intermittent, it may be described by the patients as cutting or cramp-like; sometimes it is defined as simulating labor pains and occasionally patients complain of bearing down pains. It is usually localized over the site of the lesion but it may be felt on the opposite side of the abdomen or over the abdomen generally. Not infrequently, vomiting attacks accompany the onset of the pain probably due to reflexes such as are evoked by any acute abdominal disease. Unfortunately for the accuracy of diagnosis, the character of the pain has no definite bearing on the character of the lesion; that is, one cannot tell, in the vast majority of cases, whether one is dealing with a tubal mole, an unruptured tubal pregnancy, or a tubal abortion. If we were able to do this, some of our patients at least, would escape operation. There is usually no mistaking, however, the pain which accompanies tubal rupture. It is sharp and cutting in character and is associated with such evidences of shock and internal bleeding that the diagnosis of this particular episode is usually not difficult. Yet a similar picture can sometimes be seen as a result of a tubal abortion.

It is unusual for the pain of an extrauterine pregnancy to be localized over the uterus. When it is so described, a uterine abortion must be carefully considered.

*Other Symptoms*.—The concomitant symptoms of pregnancy are often present and as often absent. But a full feeling in the breasts, vomiting, nausea, and sometimes frequent urination are complained of. Many patients on questioning, will answer that they thought themselves pregnant. But it is the irregular bleeding or the pain which has compelled them to seek advice.

Among the signs which may lead to the diagnosis of extrauterine pregnancy is the rise of temperature, varying from 99° to 102.5° F. I was among the first to point out this phenomenon in 1905 and the observation has since been confirmed by various writers. It is necessary only to exclude the temperature due to

an infected abortion to verify the presence of an ectopic pregnancy when the other signs of this abnormality are present. The rise of temperature has two causes; one is the pouring out of blood into the abdominal cavity which absorbs very slowly. The other is the very common occurrence of pelvic peritonitis of a mild degree about the extravasated blood and the tube itself. It is quite usual to find filmy adhesions about the diseased tube, and in the case of an hematocele a thick capsule is eventually developed. In cases of infected hematoceles, the temperature is, of course, much higher than I have indicated and is not to be taken as an indication of the presence of an extrauterine pregnancy *per se*.

The pulse may or may not have a bearing upon the diagnosis. A very rapid and feeble pulse in the presence of great pallor and with the evidences of an intraabdominal hemorrhage, would naturally lead to the diagnosis of a ruptured ectopic pregnancy. But the other varieties of this condition give no pathognomonic signs in the pulse. Prolonged bleeding, even without rupture, will eventually affect the character of the pulse and with a relatively low hemoglobin count, may weigh in the balance in favor of an ectopic gestation. But the pulse alone gives no definite clue to the presence of this condition.

*Local Signs.*—Usually the cervix will be found softened, but not as soft as in a uterine pregnancy of the corresponding duration. The uterus itself is almost invariably enlarged and has a feeling of softness. But I have never been able to elicit the Hegar sign in a case of extrauterine pregnancy with a single exception and this was in a case of simultaneous intra- and extrauterine pregnancy.

In cases of unruptured tubal pregnancies, of tubal abortions and tubal hematomata, a characteristic local finding is the presence of a mass on one side or the other of the uterus. It may be high up near the top of the broad ligament, it may be between the layers of the broad ligament, or it may be found most easily in one of the lateral fornices.

Depending on the character of the lesion at the time of the examination, this mass may be elastic, or it may be boggy, so that it feels as though the finger might indent it; or, if it is an accumulation of blood, it may feel like a cyst. But the presence of a mass of this general character on one or the other side, must always give rise to a suspicion of an extrauterine pregnancy, es-

pecially if other convincing data are to be found in the history or by examination.

The pulsation of the uterine artery over the mass is not necessarily of pathognomonic significance. It is often present and is frequently absent and may also be found in other conditions. But it is worth nothing.

One thing can be said with certainty concerning the mass: it is always tender. The moment it comes between the examining hands the patient complains of pain. This may be set down as an invariable rule and is highly suggestive, when considered with other symptoms, of the presence of an extrauterine pregnancy.

The blood count is of little use in the diagnosis. Very often the white cells run from 15,000 to 25,000 after rupture, and frequently before they will number from 10,000 to 15,000. The hemoglobin count, too, gives little indication, although in cases of prolonged bleeding it corresponds to the figures of an acute anemia. When it is below 60 per cent. it may be of help in establishing a diagnosis.

When confronted with a ruptured tubal pregnancy, one frequently finds no mass. The ruptured tube has collapsed, having extruded all its contents into the abdominal cavity. But in these instances the picture is usually so complete that the local examination is only a perfunctory performance.

The difficulties of making an absolute diagnosis may be illustrated by the operative finding in one case in which the patient had a tubal abortion on one side, a pyosalpinx on the other, and the uterus was the seat of multiple fibroids.

In cases of grave doubt where it seems essential to make a diagnosis before opening the abdomen a posterior vaginal incision may be made. If blood is present in the peritoneal cavity, of course the diagnosis is clear. But this procedure is not usually necessary, because in most doubtful cases the indication for opening the abdomen is present anyway. And there is always the danger of infection, there being no better culture medium than the free blood in the abdomen.

Not infrequently one of the symptoms given by the patient is that of faintness. This may vary all the way from a slight feeling of faintness to complete syncope. When a tubal abortion or rupture takes place, the patient usually faints, but she may also have the feeling of faintness during the few weeks in which she is pregnant in the tube, and this is a highly suggestive symptom when taken in connection with the other features of the case.

I think it is safe to say that if one is called to see a woman who has suddenly fainted, who is exceedingly pallid and who has a rapid pulse, the suspicion of an extrauterine pregnancy is justified.

*Symptoms of Later Months.*—If the fetus has been extruded from the tube and goes on to further development, the symptoms may become most complex. I have seen but three cases of abdominal pregnancy beyond the third month. In all of them the difficulty of accurate diagnosis was considerable. The symptoms were those of pregnancy, with pain, signs of pressure on bladder or rectum, quite profound anemia. The local findings were those of an intraperitoneal tumor. But when the results of the examination were correlated with the history, the suspicion of the existence of an abdominal pregnancy was at once aroused.

*Differential Diagnosis.*—An extrauterine pregnancy must be first differentiated from a uterine pregnancy with an impending or an incomplete abortion. The size of the uterus, the open cervix and the bright red bleeding, and the absence of pain on either side in the latter case will usually be sufficient to determine the condition. The microscopic examination of the expelled pieces will be of great aid, as the decidua of an intrauterine pregnancy differs materially from that of an ectopic gestation.

Inflammatory diseases of the tube—hydrosalpinx and pyosalpinx—will come next in order. And here it is excusable to make a blunder, for these conditions give rise to a temporary amenorrhea at times, and sometimes to intermenstrual spotting. When one is confronted, therefore, with these symptoms and the presence of a tender tumor at the side of the uterus, a wrong diagnosis is not to be ridiculed. And yet the size and texture of the uterus and the absence of signs of pregnancy should help to render the diagnosis correct.

Small ovarian cysts in combination with an abortion of an intrauterine pregnancy may also give rise to doubt in the mind of the physician. The advantage to the patient, however, under these circumstances, is the fact that whether the absolute diagnosis can be established or not, she has at least a condition which requires operation.

In presenting you this array of facts, I have refrained from giving figures and statistics and have only summed up our experience in 130 cases.

I trust I have not made it appear that the diagnosis of extra-

uterine pregnancy is impossible, but the more of these cases I encounter, the more reluctant I have become to contend for the ease of diagnosis in all of them and the more I hesitate to pronounce a doubtful case one of extrauterine pregnancy.

#### SUMMARY.

1. Patients should be regarded as suspicious of having an extrauterine pregnancy, who give a history of irregularity of menstruation, of spotting, and of abdominal pain usually of a cramp-like character.

2. The uterus does not usually correspond in size to the assumed length of the pregnancy.

3. If, at the same time, a soft tumor which can be felt adjacent to the uterus, the diagnosis is probable.

4. There may or may not be the concomitant signs of pregnancy.

5. Women seen in collapse with a rapid pulse should be re-regarded as having an extrauterine pregnancy when other definite conditions are clearly not responsible for the syncope.

120 WEST EIGHTY-SIXTH STREET.

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#### FISTULA IN ANO.\*

BY

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UNDER the operative treatment of fistula in ano, many textbooks on diseases of the anus and rectum recommend that the tissues over the sinus be laid open and the wound packed with gauze and allowed to heal by granulation, or, after the sinus has been laid open and the diseased tissue has been dissected out, to immediately close the entire wound with sutures.

The first procedure, the one usually employed by the general surgeon, is a mutilating operation, one that takes an indefinite time for the wound to heal, requires many painful dressings, and often leaves the patient unable to control flatus and liquid bowel movements, and, in some cases, is followed by a painful scar. The last two conditions not infrequently cause the patient to seek further surgical attention.

The technic carried out by the second method is sometimes successful, but, as a rule, the tissues, as would be expected,

\* Read before the Philadelphia Obstetrical Society, Oct. 4, 1912.



become infected, the wound breaks down, and a cure is finally brought about, as in the first procedure, by granulation.

On one occasion when about to pack the wound after laying open the tissues over the sinus, from the cutaneous opening to the rectal opening, I was impressed that the condition I had created was analagous to what every gynecologist and obstetrician has seen many times, a rupture of the perineum with division of the sphincter ani and a laceration of the bowel. Realizing there was no excuse to leave the patient in such a mutilated condition, the following operation was performed: The bowel was dissected free, the same as is done for a complete laceration of the perineum with involvement of the rectum, until the upper angle of the incision could be brought down below the edge of the sphincter muscle. After the divided ends of the sphincter ani had been approximated, the skin surfaces were sutured, beginning at the anal margin and extending outward, leaving the outer angle of the wound open for the purpose of drainage. The free bowel was then sutured to the skin at the anal margin, and the sinus packed with gauze.

The patient had perfect control of the bowel and the recovery was as rapid and complete as after a simple perineorrhaphy. The greater part of that operation was not to cure the disease, but to repair the damage done by the scalpel.

Since then, I have been content to repair the damage which exists, and have accomplished the result by the following technic:

The patient is placed in the lithotomy position and the sphincter ani is well stretched. The internal opening of the fistulous tract is located, the bowel is caught with rat-tooth artery forceps (Allis forceps) and cut around the mucocutaneous margin. The bowel is then dissected free until the opening can be drawn down without tension below the sphincter muscle. The excess of tissue is cut away and the bowel sutured to the cutaneous margin. Thus far the operation is identical with that employed for rectovaginal fistula. The external opening of the fistulous tract is enlarged by cutting outward (away from the anus), the sinus after being cureted or after the diseased tissue has been dissected out, is disinfected with Churchhill's tincture of iodine, and a little gauze inserted for the purpose of drainage.

I have performed this operation a number of times; convalescence has been rapid and the results have been thoroughly satisfactory. The sphincter ani is not divided, provision is

made for free dependent drainage, which eliminates pressure on the bowel, and as there is no leakage to reinfect the sinus, the wound heals rapidly.

This technic can be employed in all varieties of fistula in ano, providing the openings in the bowel are not too high, that the bowel is in good condition, and that it can be dissected sufficiently free to be brought down the desired distance.

When the leakage from the bowel, which keeps the sinuses infected, is eliminated, the sinuses after being laid open, not into but away from the lumen of the gut and treated as sinuses are in other parts of the body, healing should take place in the usual time.

We should all try to do conservative surgery and there should be no excuse to open a sinus into the bowels, when it can be opened elsewhere.

1527 SPRUCE STREET.

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## TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRI- CIANS AND GYNECOLOGISTS.

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*Proceedings of the Twenty-fifth Annual Meeting, held at  
Toledo, Ohio, September 17, 18 and 19, 1912.*

*The President. X. O. WERDER, M. D., in the chair.*

(Continued.)

DR. ROLAND E. SKEEL, of Cleveland, Ohio, presented the report of a case of

FIBROID OF THE STOMACH WITH PERFORATING ULCER. TRANS-  
GASTRIC RESECTION. RECOVERY.

S. E. S., male, æt. forty-eight, an unusually robust teacher, of perfect habits and with no previous history bearing upon the present illness, was taken with an attack of hematemesis and melena on February 8, 1912. His physician diagnosed duodenal ulcer and placed him upon appropriate medical treatment notwithstanding which dark blood continued to make its appearance in the stools. When seen on February 16, 1912, nothing new could be elicited. The age, sex, entire absence of previous symptoms and sudden onset seemed to bear out the original diagnosis which was concurred in. The patient was then in fair

general condition and seemed to be improving, with a pulse of 70 and hemoglobin 60 per cent. He was accordingly sent to the hospital with the idea that as the hemorrhage was decidedly on the decline he might entirely recover from its effects under rectal feeding, etc., when gastroenterostomy with infolding of the ulcer might be done.

For two days the condition continued to improve but at the expiration of this time there was sudden but not agonizing abdominal pain with moderate elevation of the pulse rate and a decided change in the facial expression.

Under nitrous oxide anesthesia the enormously fat abdomen was opened and the duodenum exposed with considerable difficulty only to find it in perfect condition and containing considerable quantities of grumous blood.

On palpating the stomach a mass could be detected in the posterior wall at the junction of the body and the antrum. This mass was round and moved with the stomach and upon exposing it by an incision transversely through the anterior gastric wall, proved to be a fibroma. Running from the apex of the tumor upward was a necrotic area, as shown in Plate I, extending through the mucous and muscular coats and from which arterial bleeding was clearly in evidence. The close adherence of the tumor to the posterior peritoneal covering of the stomach made an attempted enucleation without opening the lesser peritoneal cavity impossible and the posterior stomach wall was consequently resected transversely after drawing it through the anterior incision. An attempt at clamping before resection, failed and the lesser peritoneal cavity was protected by gauze packing after the first incision was made.

Closure of the posterior incision was effected by through-and-through sutures passed, of course, from the mucous side, and as an additional precaution a small cigarette drain was left in the lesser cavity. No leakage took place and the wound healed without difficulty. The patient left the table in good condition, but, as happens so frequently after gas anesthesia, developed profound shock and was in a critical condition for three or four days. Eventual recovery was complete and the patient has practically regained his previous health although subject to occasional attacks of palpitation and cardiac weakness.

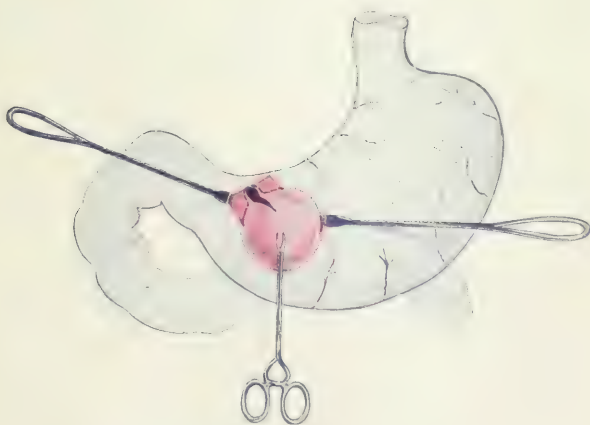
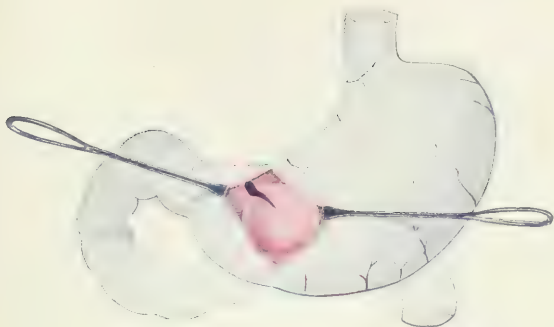
### SEPTIC PELVIC THROMBOPHLEBITIS.<sup>1</sup>

BY

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THE frequency of septic pelvic thrombophlebitis and its high mortality makes this subject of sufficient interest to bring it up for discussion before our society. To intelligently discuss this

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



- I. FIBROID IN POSTERIOR STOMACH WALL; DARK AREA—ACUTE PERFORATING ULCER.
- II. DOTTED AREA—LINE OF EXCISION THROUGH POSTERIOR STOMACH WALL.



subject, it is necessary for us to understand the meaning, formation, etiology and progress of a thrombus. Thrombus is frequently used synonymously with clot. To understand what is meant by thrombus it is best to differentiate it from a clot, for even men like Virchow not many years ago, considered thrombus formation and blood coagulation to be identical processes(54).

*Thrombus and Clot Differentiated.*—A thrombus is not a clot. A clot forms in a stagnant circulation, while thrombus can form only in the current blood(54). While in clot formation the fibrin ferment is a chief factor, in thrombus formation it does not play any primary rôle at all (Aschoff and Lubarsch (54)). A clot formation is based on the entangling by fibrin of red and white blood cells while a thrombus formation is based primarily on agglutination of blood platelets<sup>1</sup>, the fibrin and blood cells becoming deposited in the thrombus secondarily. A clot is primarily independent of the vessel wall while a thrombus is always adherent to the wall of the vessel.

*Formation of Thrombu.*—Observing types of thrombi in their early stages we find them to consist almost entirely of coalesced platelets, the leucocytes, fibrin and erythrocytes (that we usually find in thrombi at the margins or between the platelet masses) appear later. It is upon the degree of the prevalence of these secondary blood elements in the thrombi that their classification into hyaline, white and red depends.

The hyaline thrombus is very small. It is found chiefly in capillaries and very small vessels. It may be composed of a mass of ordinary blood platelets, showing only here and there a leucocyte, or of platelets resembling colorless erythrocytes, or again it may consist of a number of layers, shading off one into another, beginning with a hyaline colorless layer, gradually passing into a layer of blood platelets, then changing into a layer of blood cells poor in hemoglobin.

The white thrombus is much larger in size. It is the most common and therefore the most important one. It is found in

<sup>1</sup>According to Wright the most typical platelets are derived from the megacaryocytes of the bone-marrow. Arnold claims that they originate from the red blood cells.

The platelets are about  $\frac{1}{3}$  micron in size, very fragile, round or oval, have no hemoglobin, no nucleus, and no chromatin. They have a tendency to agglutinate outside the body and under the microscope they are seen in clumps between strands of fibrin. They number between 200,000 to 860,000 per cubic centimeter and are frequently mistaken for the plasmodium malarie, especially when they chance to lie on red cells.(1)



the large vessels and is composed of masses of blood platelets, separated by a close network of fibrin which may or may not hold leucocytes and erythrocytes.

The red thrombus is found in aneurysms and large veins. It begins as a platelet thrombus but the fibrin appearing later enmeshes erythrocytes in such large numbers that it gives the thrombus a red appearance.

The so-called acute red thrombus occurs only in a completely arrested blood current as in a ligated vessel. The column of stagnant blood above the ligature forms a clot and only at the point of ligation of the vessel on account of injury to its wall can a collection of platelets be made out(1).

#### ETIOLOGY OF THROMBUS FORMATION.

Let us consider now what factors bring about the agglutination of the platelets into masses and make them adhere to the vessel wall, in other words let us consider the causative factors of thrombus formation.

*Slowed Circulation.*—One of the most important factors in thrombus formation is slowed circulation. While the platelets under normal conditions circulate with the corpuscles in the axial current, they appear in the outer zone when the circulation is sufficiently slowed, thus coming in contact with the vascular intima. Moderate retardation, however, may not be sufficient; it may favor accumulation of only the white corpuscles in the outer zone of the vessel, while to bring the platelets into the outer zone considerable slackening of the stream is necessary. But it must not be a complete blocking<sup>1</sup>, for a blood current is necessary to bring sufficient number of platelets to any given point for thrombus formation. In a completely blocked circulation this cannot occur. Of course the larger the platelet count, the greater is the number of platelets brought in contact with the vessel wall. This view is held by Eberth, Schimmelbusch, von Recklinghausen, Aschoff, Lubarsch, Ferge, Zurhelle and others. Since for thrombus formation the platelets must be brought in contact with the vessel wall (for a thrombus must be

<sup>1</sup> Baumgarten(54) tied a vessel off in two places and found the blood between the ligatures fluid after a week.

Schwalbe claimed to have found a blood platelet thrombus in a doubly ligated vessel but Derevenko found that the reason for Schwalbe's thrombus was the puncture in the vessel wall, which allowed some of the blood to flow out. The blood platelets accumulated at the point of puncture during the slow outflow of the blood(11).

adherent to a vessel wall) retardation of blood current must be considered an important factor in thrombosis.

This characteristic ability of retarded circulation to predispose a vessel to thrombosis is more frequently seen in the venous system than in the arterial. According to Lubarsch venous thrombi are met with four times as frequently as the arterial.<sup>1</sup>

The explanation of this greater predisposition is easy. The slower speed of the blood current, the lower blood pressure, the absence of pulsation, the fixation of the venous wall in certain situations to the fascia and bones, the presence of valves and the flow of the venous blood from smaller into larger vessels, all these physiological peculiarities of the venous system tend unquestionably to retard the blood current and thus render the venous system a more favorable locality for thrombus formation than the arterial system.

The same relation between retardation of blood current and greater tendency to thrombosis is noticed in individual vessels. Such are the vessels, the blood current of which is subject to a more than normal resistance, as the femoral vein passing over the elevated point under Poupart's ligament, such are the vessels that are under constant external pressure as the left common iliac under the pressure of the overlying arteries<sup>2</sup> and the pelvic vessels in general under pressure of the fetal head, such are also dilated blood channels that receive their blood from smaller vessels as the cerebral sinuses and the cardiac chambers.<sup>(27)</sup> Thus we see that wherever we find in the circulatory system physiological conditions interfering with the normal rapidity of the blood current, we find also in the same place a predisposition to thrombus formation. If this holds good in physiological retardation it should be found to be true also in pathological, and it is a clinical fact, well recognized by many that in diseases inducing unfavorable cardiac changes or causing in any way retardation of blood flow, thrombosis is frequently met with. The most striking example of this is the uterine fibroid, a disease accompanied with unfavorable heart changes<sup>3</sup>

<sup>1</sup> Ferge, in the Freiberg Path. Institute, found 76.3 per cent. of venous thrombi to 23.7 per cent. of arterial<sup>(27)</sup>.

<sup>2</sup> The left iliac vein as it is known, is under pressure of the right common iliac (almost at right angle), left hypogastric and median sacral arteries and according to Kistler (Thrombophlebitis of the Left Leg., *J. A. M. A.*, Aug. 10, 1912)<sup>(31)</sup> also the ilio-lumbar artery. The right common iliac vein is under pressure of the right common iliac artery only and then under an acute angle.

<sup>3</sup> It is generally admitted that there is a clear relationship between myoma and fatty degeneration of the heart. Strassman and Lehman found anatomical lesions of the heart in 40.8 per cent. of their myoma cases<sup>(27)</sup>.

and strikingly predisposed to thrombosis. Klein in 12,923 laparotomies found 270 thrombi, Black in 3000 cases, thirty-five thrombi, Mayos in 1788 cases, eighteen thrombi and Herff in 2679 cases eighty-one thrombi or in a total of 20,440 cases, 404 thrombi or 1.9 per cent. After laparotomies for myoma it was found as follows: Zurhelle 2.5 per cent., Fritsch 2.75 per cent., Kelly and Cullen 3 per cent., Wertheim 3.3 per cent., Bouchardt 4.6 per cent., Albanus 4.6 per cent., and Wenzel 5 per cent.(27).

Interesting clinical observations have been made by reliable authorities which may be utilized here to confirm the relationship existing between retardation of the blood current and thrombosis. Thus, a long rest in bed weakening the heart muscle and thus slowing the circulation(22) is found according to the observations of Hoffman and Kummel to favor thrombosis(24). Trendelenburg's position with knees strongly bent over the table, slowing, by pressure on the popliteal veins, the circulation in the lower extremities, predisposes to thrombosis according to Olshausen and Zweifel(23).<sup>1</sup> Pressure with abdominal retractors over the branches of the epigastric vein may cause in them thrombosis according to the observations of Clark.<sup>2</sup> Prolonged mental depression weakening the heart force is claimed by some to predispose to thrombosis. Ether narcosis producing secondary heart weakness (Reidell) favors thrombosis the first day after anesthesia according to the observations of Lennander.

*Changes in Blood-vessels.*—The mere slowing of circulation will not suffice to cause thrombi, for it only brings the platelets into the outer zone of vessels, thus allowing them to come in contact with the endothelium(10). But to get a thrombus we must have an agglutinated mass of platelets adherent to a vessel wall. This can occur only in the presence of a diseased intima of the vessel wall.

It is universally recognized that the normally smooth<sup>3</sup> endothelium of the vascular wall has a great influence in maintaining the fluid state of the blood, but an abnormality in the vascular endothelium may induce the viscous metamorphosis of the

<sup>1</sup> Zweifel had no emboli in 1600 laparotomies done in the horizontal position nor in vaginal panhysterectomies, while he had twenty-one cases of embolism in laparotomies in the Trendelenburg position(23).

<sup>2</sup> In a case laparotomized by Clark a second time, three months after the first operation the epigastric vein was found thrombosed(23).

<sup>3</sup> In his experiment No. 16, Guthrie of Pittsburg implanted in the course of a rabbit's carotid artery a segment of vena cava hardened with formaldehyde, dehydrated with alcohol and impregnated with paraffin, and this dead piece of vein functionated for twenty-two days with no sign of thrombosis (Adami).

platelets coming in contact with it and permit a platelet mass thus formed to adhere to the abnormal part of the vessel wall. These abnormal changes in the vessel may be extensive, when induced by injury, inflammation, degeneration, or neoplasm or it may be very slight and even microscopic, when induced by impaired nutrition of the endothelium as noticed in anemia, toxemia and chilling of blood-vessels during operations.

The relative importance of blood-vessel disturbances and retarded blood current in thrombus formation is best shown by the fact that while in arteries pathological changes are much more commonly met with than in veins(27), yet, because of the greater current force, arterial thrombi are very rare in comparison with the venous ones. In fact, Lubarsch and Zurhelle studying this question came to the conclusion that, so long as the circulation is strong and the blood cells are not injured, the changes in the vessel wall will not cause thrombus formation.

3. *Alteration in Character of Blood.*—In studying the question of the etiology of thrombus formation, the blood changes met with during the course of the disease must be considered, and here again we want to emphasize the point that the increase or the reduction of fibrin has no bearing on this question and that blood coagulation time has no constant relation to thrombus formation(54).<sup>1</sup> But while coagulation time is of no importance in thrombosis, the increased viscosity or viscous metamorphosis is quite generally admitted to be an important factor. Bachman(27) found that in diseases with high viscosity thrombi are frequently met with. Its relative value, however, at present is not settled.

The blood change that is universally admitted to be present in thrombophlebitis is the increase in the platelet count. While their number per centimeter even in healthy people is not uniform (from 200,000 to 860,000), yet there is a well recognized parallelism between their numbers and the predisposition to thrombosis, *i.e.*, an increase in platelets is found in diseases predisposed to thrombosis and a decrease in diseases in which thrombosis is very rarely or never met with. As an interesting example we will cite chlorosis and pernicious anemia, the first with a high platelet count and a pronounced tendency to thrombosis (Muir), the other with a very low count and the striking

<sup>1</sup> According to Welch, there may be very extensive bacterial inflammation of the venous wall even with bulging of the intima into the lumen without thrombosis(52).

<sup>2</sup> Schimmelbusch succeeded in inducing a thrombus in a dog whose blood he rendered incoagulable by injection of albumose(52).

absence of thrombosis (Hayem, Birch Hirschfield(54-52). In connection with our subject it is important to remember that there is an increase of platelets at the end of pregnancy, after delivery, during septic infection, in post hemorrhagic anemias and in states of bad nutrition in general <sup>1</sup>(52).

4. *Infection*.—We see then, that for thrombus formation the necessary factors are: 1. Blood changes leading to increased number of platelets and viscous metamorphosis; 2. retarded circulation, and 3. vascular changes in the intima. There is another causative agent in thrombosis that must be considered and this is infection. According to Fromme,<sup>2</sup> von Jackowsky, Latzko, Veit and others, infection is the only factor in thrombosis, the factors referred to above being secondary. They cite the experiments of Fromme, von Jackowski and others to prove this view. But their view cannot be adopted by us. Their experiments were either proven to be wrongly interpreted or were entirely discredited by such authorities as Zurhelle, von Bardeleben, Rubesch, Heller<sup>3</sup> and others. Besides, their view cannot explain why we meet thrombosis more commonly after the hysteromyomectomy than after operations for septic adnexa, why thrombi are met with in the venous circulation more frequently than in the arterial, why the left lower extremity is more subject to thrombosis than the right one, why thrombi may develop as late as three and six weeks after an operation and why, in spite of the most careful asepsis in the hands of the

<sup>1</sup> Other examples of the parallelism are: Increase of platelets in erysipelas, meningitis and influenza. In pneumonia the number is increased but in severe cases the number is diminished occasionally. There is also an increase in tuberculosis, various cachectic conditions and during the subsidence of, and early convalescence from infectious diseases such as typhoid fever and pneumonia. On the other hand there is a decrease or entire absence of platelets in purpura hemorrhagica (Denys, Hayem, Erlich), a decrease in malaria and in typhoid during progress of the disease.

<sup>2</sup> Fromme reported in 1908 experiments on rabbits in whose jugular veins he inserted sterile and infected silk threads. He found thrombi only in the ones with infected threads. A year later, Zurhelle disproved it. He, under most careful asepsis, repeated Fromme's experiments. In a large number of cases he found typical blood platelet thrombi whether he used sterile or infected silk threads(54).

Von Jackowsky tied blood-vessels of a rabbit with gum bands; twenty-four hours later he injected into these vessels bacterial cultures and toxins. He discovered afterward thrombi in vessels but the tying of vessels brought about considerable vascular engorgement, injury and alteration to blood-vessel wall. Therefore, there is no indication that the bacteria and thrombi have any cause and effect relation. It is very likely that the bacteria appeared in this case later with the blood stream into the already formed thrombi.

<sup>3</sup> Experiments of Heller(27) with colon bacilli injections into the blood stream and that of von Bardeleben(54) with living streptococcic injections and of Rubesch(45) with staphylococcic gave negative results, *i.e.*, did not produce septic thrombi. If Welch is correct that bacteria by themselves in the blood cannot cause changes in the vessel wall, this alone would explain the reasons for the results obtained by these careful investigators.

best surgeons, thrombosis cannot be eliminated. Again it has been clinically proven that nonseptic diseases with low platelet count, low heart force and badly disturbed nutrition, bring about thrombosis without the aid of sepsis. Such are, for instance, the "quiet" thrombi of Bennett in legs of old people(5), the marantic thrombi<sup>1</sup> met with in wasting diseases, the thrombi of pregnancy before delivery, the afebrile puerperal thrombi<sup>2</sup> and experimental aseptic thrombi.

The presence of aseptic thrombi must, therefore, be admitted. But it should also be admitted that infection is an important factor in formation of thrombi. In fact, local infection by itself may, under favorable conditions, slow the circulation, injure the vessel wall, introduce the necessary blood changes and thus bring about thrombosis. As a rule, however, infection acts only as a contributory factor. If we have, for instance, a retarded blood current and an injured vessel, infection, by its increased blood platelet count and viscous metamorphosis, can supply the missing factor (blood changes) for thrombosis, but it should be remembered in this connection that thrombosis thus formed while usually septic, is not always so. Klein(27) in 215 autopsies on infected puerperal thrombosed cases found microorganisms only in 10 per cent. of thrombi. Here it might not be out of place to call attention to a predisposing factor of thrombosis, named by Felix Mendel(40) thrombophilia or an individual predisposition to thrombosis. He has noticed thrombi develop in the lower extremities and pelves of some patients from time to time after attacks of slight general infection. He attributes this predisposition to a peculiarity of blood opposite to the one found in hemophilia. His observations are purely clinical and he offers no experimental proof. Nevertheless it is worth while bearing in mind, for it may account to a great

<sup>1</sup> Marantic thrombi are met with in infectious diseases and in wasting, cachectic and anemic conditions. True, a large number of so-called marantic thrombi are found on careful examinations to be of infective origin (Vasquez demonstrated bacteria in such thrombi as far back as in 1894), but in very many instances repeated bacteriological examinations yielded negative results in such careful hands as that of Welch.(52)

<sup>2</sup> Bumm(11) speaks of the aseptic thrombus as follows: "There is an aseptic thrombus of the uterine veins in the puerperium that begins at the placental site and extends to the spermatic veins, pampiniform plexus, the hypogastric and iliac veins. If the uterine retraction is normal the venous sinuses are closed by simple contraction of the vessel walls, but in an atonic uterus they are closed by thrombi usually without symptoms. Aseptic thrombi are also found in varicose veins of the leg during pregnancy and the puerperium. Neu, in the Heidelberg Clinic, found seventeen out of thirty-five cases of puerperal thrombosis without fever.(27) Welch has found marantic thrombi without any visible alteration in the vascular intima at the site of thrombus.(52)



extent for some of the unexplainable puerperal and postoperative thrombi.

*The Progress of a Thrombus.*—A thrombus usually beginning as mural, may either remain as such or by continued growth may fill the vessel and become an occluding thrombus. If the thrombus is sterile it may go on to absorption,<sup>1</sup> organization,<sup>2</sup> canalization,<sup>3</sup> calcification,<sup>4</sup> or bland softening with or without embolism.<sup>5</sup>

In septic thrombi the changes depend a great deal on the virulence of the infecting organism. In mild infections the termination may not be different from that of the sterile ones.

In the severe infections, the bacteria finding a good culture medium in the thrombus, may gradually change it into a purulent mass and give rise, in bad streptococcic cases, to suppuration and even gangrene of the blood-vessel. If an embolus be detached from such a thrombus it may cause metastatic infection, the gravity of which depends on the virulence of the infecting agent, the location of the embolus, and the general resistance of the patient. So much for thrombus formation.

Now, before we take up septic thrombophlebitis, a few words must be said about phlebitis and its relation to thrombosis. A thrombus may exist without a phlebitis, for as referred to above,

<sup>1</sup> A thrombus of moderate size may, through leucocytic activity, undergo resolution and absorption, thus allowing the vascular channel to be restored to its natural lumen. This, of course, is the most favorable termination of a thrombus if embolism does not occur during the resolution.

<sup>2</sup> Organization is a substitution of vascularized connective tissue for the thrombus. As a result of chemotactic irritation leucocytes and so-called migratory cells are attracted into the site of the adhesion. Through their activities the thrombus is slowly disintegrated and absorbed. While this absorption is going on, granulation tissue forms in the thrombus, the cells being derived from the leucocytes, from the endothelium and other fixed cells of the vessel wall, and the new vessels being derived chiefly from the vasa vasorum. This new tissue gradually contracts, converting the vessel into a small contracted mass of fibrous tissue, a fibrous cord with complete occlusion. Such organization ends the danger of thrombus.

<sup>3</sup> The organized thrombus does not always tend to complete occlusion of the vessel. The blood-vessel may only be narrowed at the site of the thrombus. It may present a number or channels of a cavernous structure. These cavernous septa or channels may disappear, restoring the lumen of the vessel with perhaps a few fibrous bands as seen in the normal cerebral sinuses.

<sup>4</sup> In certain regions of the body notably in the uterine plexuses, thrombi frequently become the seat of calcareous deposits and are converted into phleboliths.

<sup>5</sup> Instead of organizing into connective tissue or calcareous substances, the thrombus may soften and liquefy. This process is called also puriform softening because of the mistaken idea about its contents, which was supposed to have been pus. It results from cell digestion by the thrombotic leukocytes or by the migratory cells outside of the thrombus and consists of a brittle shell the interior contents of which are composed of necrotic fatty leukocytes, albuminous and fatty granules, blood pigment and altered red corpuscles. This unorganized condition makes the thrombus a starting-point for bland emboli, with the degree of the danger depending upon the size of the embolus and the importance of the organism to which it is carried.

vascular changes caused by slight injuries or nutritive disturbances are sufficient to permit the platelet masses to adhere to the vessel wall. A phlebitis even when septic may exist without a thrombus for unless the inflammation is very severe and is accompanied with periphlebitis, it supplies only one of the three factors necessary for thrombus formation, *i.e.*, the diseased vessel. When a thrombus is followed by a phlebitis or *vice versa*, a phlebitis followed by a thrombus, a condition known as thrombophlebitis appears, which may be sterile or septic. A nonseptic phlebitis in presence of other necessary factors may give rise to a sterile thrombus thus forming a nonseptic thrombophlebitis.

A septic phlebitis or septic thrombus may respectively induce a septic thrombus or a septic phlebitis and thus give rise to a septic thrombophlebitis. But a mildly septic thrombus may, by its irritative properties, cause a nonseptic phlebitis(52), and again, a mildly septic phlebitis may, in presence of other favorable factors cause a nonseptic thrombus. We see then that not every case of thrombus nor every case of phlebitis is necessarily followed by thrombophlebitis, and not every case of thrombophlebitis is necessarily septic.

Omitting from our further consideration the thrombus and phlebitis as separate entities and excluding as far as possible the sterile thrombophlebitis we shall now take up the septic pelvic thrombophlebitis and attempt to bring out the points that may throw light on the present status of its treatment.

**Pelvic Septic Thrombophlebitis.**—The most important and to us the most interesting cases of pelvic septic thrombophlebitis are those of puerperal and postoperative origin, and of these the more common are the puerperal ones.

**Septic Puerperal Pelvic Thrombophlebitis.**—The striking frequency of septic pelvic thrombophlebitis in the puerperium is not difficult to explain. The condition of the blood, the dilated blood-vessels, the torn and gaping sinuses, the presence of bacteria in the vagina and the cervix, the extensive pelvic traumatism, the prolonged dorsal position and the after-effects of functional disturbances of pregnancy, all these conditions are most favorable for thrombophlebitis.

As mentioned above, not every case of thrombophlebitis is septic, but there is no question that the great majority of cases of pelvic puerperal thrombophlebitis in septic cases are septic. The bacterial agent of this form of thrombophlebitis is most

commonly the streptococcus. The rapidity and manner of the extension of this form of thrombophlebitis depends on the degree of the bacterial virulence and the degree of the patient's resistance. If the streptococci are highly virulent, especially if the patient is of low resistance, the infection usually begins as phlebitis. The streptococci enter from the endometrium into the endothelium of the veins and rapidly ascend along the endothelium of the vessels involving in a short time the uterine plexus, the spermatic, hypogastric, iliac, femoral and even the vena cava. Here the septic phlebitis is the predominant primary feature, the thrombus formation being secondary. If suppuration occurs, it begins at the vessel wall extending up and along the intima, the thrombus undergoing purulent changes later. (24-29-11)

In the development of milder forms of puerperal sepsis the veins are found thrombosed prior to the appearance of the infection. The bacteria invading the sinuses attack the thrombus first, and if suppuration takes place it begins in the center of the thrombus, extends toward its periphery, setting up a secondary phlebitis (11).

There is a form of puerperal septic thrombophlebitis that is secondary to lymphangitis. The bacterial causative agent of the lymphangitis may bring about a thrombophlebitis by local extension, *i.e.*, the bacteria found in the area of the septic lymphangitis may attack the neighboring vessels, causing septic phlebitis and then a thrombus. This same bacterial agent may cause thrombophlebitis through the general circulation, *i.e.*, the bacteria may be carried from the lymphatic system into the general circulation, cause the necessary blood changes, weaken the heart force and thus bring about a thrombus in a pelvic vessel that happens already to be injured or diseased. While such a thrombus primarily is usually not septic, it generally becomes so secondarily on account of the presence of the bacteria in the blood. The septic thrombophlebitis thus formed is of course secondary to the lymphatic infection and should be considered only as a complication of still graver an infection, *i.e.*, lymphatic septicemia.

*Postoperative Septic Pelvic Thrombophlebitis.*—The postoperative pelvic thrombophlebitis, while found in about 2 per cent. of laparotomies, is not as commonly met with in our practice as the puerperal. We do not believe that the postoperative thrombophlebitis is as frequently septic as the puerperal and we certainly cannot adopt the view that pelvic thrombophlebitis is always

septic. The higher percentage of thrombophlebitis after myomec-tomies than after salpingooöphorectomies for infected adnexa, is sufficient to disprove it. Besides, a patient with a weak heart, in a bad state of nutrition, who always shows a high platelet count has all the factors necessary to give rise to aseptic thrombophlebitis if one or more of his veins is injured during operation (by separation of adhesions, by pressure with retractors or by simple chilling). There is no need to add infection as a requirement for postoperative pelvic thrombophlebitis.

But while we cannot consider infection as the only cause of postoperative thrombophlebitis, it is unquestionably the most common one and is almost always local. An infection carried to the cellular tissues around a vein may give rise to a phlebitis and periphlebitis, which limiting the vascular elasticity causes local slowing of circulation. An endophlebitis with consequent damage of the intima usually follows in such cases, bringing about a vascular condition necessary for the attachment of the platelet masses. If now the necessary blood changes are present in the circulation, from one of the many possible causes septic thrombophlebitis develops.<sup>(23)</sup>

It should be remembered here that in the postoperative just as in the puerperal septic thrombophlebitis, bacteria are not always found in the thrombus. In fact it is not always caused by direct action of the bacteria. For, while streptococci enter the lumen of the vessel to bring about a thrombus, the staphylococci and colon bacilli bring about a thrombus through the actions of their toxins and the products of decomposition. Here we may find an explanation for postoperative thrombophlebitis in clean cases with mild general symptoms. In separating bowel adhesions in such cases, the colon bacilli may find entrance into the perivascular tissues and by their toxins cause thrombophlebitis in the manner shown in Rubesch's experiments.<sup>1</sup>

Speaking of septic thrombophlebitis we must distinguish between the acute on the one hand and the subacute and chronic on the other. This distinction is based on the extent of the gravity of the infection. The graver forms show an earlier onset, severer symptoms, more rapid progress and higher mortality. The milder forms show a later onset, milder sym-

<sup>1</sup> Rubesch's<sup>(45)</sup> experiments on animals with staphylococci and Heller's with colon bacilli show that even if these bacteria are deposited near the surface of the vessel wall, thrombi are found on the intima before the bacteria have a chance to invade the entire vessel wall. In such thrombi no bacteria can be discovered, their formation having been caused by bacterial toxins permeating the venous walls.

toms, slower progress and a much lower mortality. The first type is the acute one, the second the subacute or chronic.<sup>1</sup>

*Acute Pelvic Septic Thrombophlebitis.*—In our study of septic pelvic thrombophlebitis we shall discuss chiefly the acute type, referring only here and there to the chronic type wherever its distinctive features demand it.

*Symptomatology.*—If we bear in mind the rapid progress and high mortality of acute septic thrombophlebitis, we can easily understand the importance of recognizing it early, for the energetic treatment such a disease demands, must be undertaken early if results are to be expected. To do this we must have an early diagnosis. But can we do it? Mahler speaks of a prodromal symptom consisting of a climbing or step-ladder pulse with a temperature remaining normal. Michaelis(32) speaks of a subfebrile temperature, meaning low rise of temperature between  $99\frac{1}{2}^{\circ}$  and  $100^{\circ}$ . Each of them considers his symptom pathognomonic of oncoming thrombosis. If such symptoms could be found they would be of great value but unfortunately only a small number of authors confirm Mahler's and Michaelis's claims, most of them discussing these symptoms either deny their existence entirely or consider them rare. These prodromal symptoms therefore cannot be relied upon, although it is worth while bearing them in mind and to take advantage of them when they do appear.

The clinical phenomena of thrombophlebitis after its onset vary with the degree of the severity and the rapidity of the extension of infection. In mild forms, the subacute and chronic types, the symptoms may be so mild as to make the early diagnosis by clinical symptoms impossible.

The characteristic symptomatology of thrombophlebitis is best seen in acute cases. In the acute cases observed by us, all early cases, the clinical symptomatology at the time of the pelvic examination was not sufficiently characteristic to determine the diagnosis. It was the detection of the thrombosed veins of the uterine plexus at the pelvic examination in conjunction with the absence of any other palpable pelvic pathology, with the presence of general symptoms of infection, that settled in our minds the diagnosis. Of the clinical symptoms that are now considered more or less characteristic and that were found in our acute cases to be more or less constant,

<sup>1</sup> The sterile thrombophlebitis is mild and often unrecognizable and does not come under the subject of our diagnosis.

the most valuable ones are the severe, frequent and irregularly repeated chills, some lasting as long as fifty minutes. The frequency of the chills in the beginning at least, did not in our cases necessarily indicate a grave outcome. A case that within one week after the first chill reached a normal pulse and temperature had nine chills during the seven days.

Another feature in the symptomatology that is considered rather characteristic and was found to be so in our cases is the temperature with its irregular pronounced remissions. A sudden rise of temperature accompanying the chill is followed within a short time by a rapid fall to its previous level where, with slight remissions, it remains until the appearance of the next chill. It is not uncommon for the temperature to go up during the chill to  $106^{\circ}$  and go down to about normal in half a day.

As to the pulse rate in our cases, it was found rather lower than one would expect judging from the temperature. In a case of ours that terminated favorably, the highest pulse was 120 and when the temperature registered  $105$  and  $105.2^{\circ}$  the pulse was 96 and 108 respectively. In this particular case, the pulse, in spite of the good behavior during the height of the disease, became intermittent during convalescence.

An interesting symptomatic feature of the disease is the absence of pain. This is not due to mental dulness, for clearness of mind is rather a general symptom of septic thrombophlebitis. The patient as a rule does not suffer and feels comfortable except for a short time during and immediately after the chill when she is desperately ill.

Edema of the lower extremities was always met with in cases of extensive thrombophlebitis, the extent of the edema depending on the severity of the pelvic thrombophlebitis. In one case that was fatal the right leg was swollen to almost three times its normal size and in another case the upper parts of both thighs, both hips, the lower part of the abdomen and the vulva were involved.

The blood picture was not found to be characteristic. Our blood cultures were most frequently negative. Such findings can easily be explained. The bacteria only entering the blood stream at intervals, are rapidly destroyed in the blood and the various organs of the body. Examinations, therefore, made more frequently and in more carefully selected moments should give better results. In fact Lenhartz claims to have obtained thirteen positive cultures in sixteen cases, his success, however,



as far as our knowledge based on literature is concerned, has not been duplicated. So far as leucocytosis is concerned it does not seem to depend so much on the severity of thrombophlebitis itself as on its complications. The erythrocytes and the hemoglobin are always low on account of the hemolysis. The influence of septic thrombophlebitis on the kidneys does not seem to be pronounced. Albuminuria was found strikingly absent except after the appearance of septic involvement of the kidney.

The complete symptomatology of the thrombophlebitis as given above is not found in every case. If the thrombophlebitis can be mapped out by palpation,<sup>1</sup> a diagnosis can be made no matter how incomplete this symptomatology may be (lymphangitis being the only condition to be excluded) but if it cannot be mapped out, a sufficient number of characteristic symptoms, above referred to, must be had before a diagnosis of septic thrombophlebitis can be made.

There is a symptom-complex which if found, may make us feel reasonably certain of the diagnosis of puerperal or post-operative septic pelvic thrombophlebitis even in absence of palpable pelvic veins. This symptom-complex we may describe as follows: A fairly good general condition, with slightly elevated pulse and temperature, with clear mind and good appearance, interrupted at various intervals by irregular intermissions of desperate disturbances consisting of a severe chill, with a pronounced rise and characteristically rapid fall of temperature, with a comparatively slight rise of pulse, and with a pronounced general depression.

*Prognosis.*—If a case is diagnosed as that of septic thrombophlebitis, how are we to take care of it? What mode of treatment should we choose? In order to obtain a better understanding of the value of the different modes of treatment, let us first discuss the prognosis of the expectant and operative treatment, for on the prognosis must, to a great extent, depend our judgment as to the choice of treatment.

The prognosis of thrombophlebitis of course depends on the

<sup>1</sup>In our experience the palpation of thrombosed veins of the uterine plexus is easy, that of the ovarian is not easy. We are not speaking of the chronic ovarian thrombophlebitis with extensive periphlebitis that one may feel through an abdominal wall of moderate thickness, we are speaking of its acute form. We must say here in a general way that a thrombus of the uterine plexus is easy to be diagnosed early by pelvic examination even before the appearance of characteristic chills, while thrombosis of ovarian plexus is difficult to diagnose early; the early diagnosis must be made chiefly by symptomatology. If our view is correct, thrombophlebitis of the uterine plexus should and will be diagnosed earlier than that of ovarian plexus.

severity of the infection and the resistance of the patient. In mild cases, subacute and chronic, the infection may remain localized and the thrombophlebitis may undergo one of the favorable changes mentioned above, with or without embolism. In severe cases, the acute ones, the cases that we are mostly interested in, the mortality is high. Arnold W. W. Lea<sup>(32)</sup> collected 566 nonoperative cases of thrombophlebitis pyemia with 327 deaths. If we add to this Latzkos' own nonoperative 199 cases of septic thrombi, with sixty-eight deaths, we get a total of 765 cases with 395 deaths or a mortality of 51.6 per cent. Of course if the statistics of the milder cases that now pass unrecognized would be obtained, the mortality of nonoperative thrombophlebitis would in all probability be found to be much lower.

Now the mortality of operative cases, no doubt, must be higher at present than it will be in the future when the diagnosis will be made earlier. But we have no other way to judge rightly statistics except as they appear in their cold figures. The number of operations at our disposal at present may be too small to make deductions from them, but if we are to use them at all we must use them as we do in any other diseases or operations, that is, count all we have. Now counting them all, we find the following:

Williams' collected cases including his own five(53).....	52 <sup>1</sup> with	28 deaths.
Latzkos' own cases.....	37 with	21 deaths.
Huggin's collected cases including his four with one death(25)	25 with	13 deaths.
The writer's collected cases.....	8 <sup>1</sup> with	2 deaths.
Total.....	122 with	64 deaths.

	Cases.	Deaths.
J. W. Taylor(49), 1905. Vaginal.....	3	0
A. A. Landin(28), 1906. Transper. lig. of rt. ovar.....	1	0
W. B. Bell(4), 1909. Trans. excis. of rt. ovarian....	1	1
H. D. Bishop(6), 1909. Trans. excis. of rt. ovarian....	3	1

Thus we get a mortality in operative thrombophlebitis cases of 52.4 per cent.

If these statistics based on only 122 cases are of any value, they show the mortality of operative thrombophlebitis to be higher than the nonoperative. While the lack of experience and the unwillingness on the part of the patient and the hesitancy of the profession to adopt early surgical measures account to a great extent for the high mortality of the operation, yet at the present stage of our experience it is difficult to say what the

<sup>1</sup> We deducted from Williams' statistics four of Latzkos' cases with three deaths, that we give under Latzkos' own statistics.

mortality will be in the future. Cases may be operated on early and die, in whom under expectant treatment the thrombus might have undergone absorption, organization, calcification or even softening with favorable termination.

With such a prognosis in operative and nonoperative cases we cannot help but believe that the prophylactic and expectant treatment must for the present occupy a very prominent position in the care of this disease.

*Prophylactic Treatment.*—We saw that in the formation of thrombus, the necessary factors are: 1. increase in number and agglutinability of blood platelets; 2. retardation of the blood current, and 3. pathological changes in the intima of a blood-vessel. We saw also that in septic thrombophlebitis, in addition to the above, infection must be added as a very important factor. It is easily seen that the prophylactic treatment of septic pelvic thrombophlebitis should consist in measures directed toward avoiding or correcting these factors. So far as the blood changes are concerned, we have at the present state of our knowledge, no measures to control them. "If it were possible, says Zurhelle, "to reduce the agglutinability of the platelets, a great deal of good could result from such measures, but we are not in possession of such measures." (54) We doubt, however, that measures directed to diminishing the increased number and agglutinability of platelets are desirable because platelet changes are beneficial when abnormal conditions need their protection. In this connection it should be remembered that even the thrombus is a natural conservative process, for a septic parietal thrombus is a temporary shield plastered on an injured vessel wall to prevent either the bacteria and their toxins from entering through it into the general circulation, or to prevent the bacteria and their toxins already in the circulation from attacking it. The same is true of the occluding thrombus. It is also protective in character. It is a temporary cork in the vessel lumen keeping the circulation away from the diseased vessel or corking up the infection in a limited area for the protection of the general circulation. There is no reason therefore to look for measures to combat this increase in numbers and agglutinability of platelets. Prophylactic here consists in correcting the abnormal conditions calling for this increase, such conditions being chlorosis, posthemorrhagic anemia, convalescence from infectious diseases, cachexias and bad states of nutrition in general. Therefore if any of these conditions be present before delivery

or before serious operative procedures, they must be taken care of by such prophylactic measures as good nourishment, tonics, rest, fresh air, etc.

So far as preventing the retardation of the circulation is concerned, the prophylactic treatment consists in adopting measures to increase the weakened heart force and to avoid anything tending to diminish this force. If a patient before delivery or operation shows a lessened heart force it should be toned up and strengthened by rest, therapeutic agents, etc. While Jaschke(26) may be right that endocarditis with good compensation, especially in young people with normal blood count, needs no preoperative attention, it must not be overlooked that a diseased heart cannot accommodate itself to the strain and shock of an extensive operation as well as a good heart. For this reason it may in such cases be a part of good prophylaxis to avoid performing extensive operations at one sitting, also to avoid prolonged anesthesia and to make every effort to allay preoperative fear and excitement. As a prophylactic measure against lowering heart force may be considered the free movements after operation and labor, especially the early getting out of bed. This allows the organs to resume earlier their normal functions, the circulation to become more active, the blood pressure to reach a more normal level and all this to increase the heart force. There are plenty of clinical facts to prove this statement. While statistics give 1 to 2 per cent. of postoperative thrombophlebitis, the surgeons allowing their operative patients out of bed early show a much lower percentage in their cases. Thus Reese gives .4 per cent., Boldt .3 per cent., Mayos 1/3 per cent., Kroenig and Doederlein none(32). Of course this early sitting up after operation cannot always be carried out. Just as good judgment must be used in carrying out this prophylactic measure as in other lines of treatment. It would be poor judgment for instance to allow out of bed early a septic case with a high temperature, an acutely anemic case after a severe hemorrhage or a case with drainage through an abdominal incision, but in the great majority of cases this prophylactic measure can be enforced with great benefit. So much for prophylactic measures against retardation of blood flow.

The prophylactic measures against the third factor of thrombophlebitis (the injury of the vessel wall) are but few and in general this factor is beyond our control. Care, however, can be practised during operation to avoid injuries to vessels wherever

it is possible. Profiting by the observations of Clark and Zweifel referred to above, we may be careful to avoid pressure by abdominal retractors on the epigastric veins and also pressure on the popliteal veins, the result of prolonged Trendelenburg position with bent knees.

The most important, most practicable and most efficient measures against septic thrombophlebitis are the ones directed against infection. They consist of course in careful observance of asepsis in obstetrical and pelvic operative procedures. With the present state of development of asepsis, and especially with the easy access of surgeons to the aseptic technic of the operating room, this prophylactic measure can be easily enforced. When one considers that in 6000 consecutive labor cases of von Herff's clinic there was no death from sepsis and that in 8000 cases in Ahlfeld's clinic there was only one death(32), the infection in this case being carried in by the patient herself, there can be no doubt that this prophylactic measure of thrombophlebitis can be successfully carried out.

It should be remembered, however, that in septic puerperal thrombophlebitis the infection is not necessarily carried in from the outside for the vaginal lochia according to Bumm and Seigert(32) was found to contain streptococci in from 50 to 75 per cent. of cases and the cervical lochia in 17.6 per cent. of cases. If therefore retained membranes or placental tissue project into the cervix or vagina they may carry infection into the uterus without any external aid. The same may be true of lacerations. Bathed in septic lochia, they may carry infection into the circulation without outside interference. As a prophylactic measure against the infective agent of septic pelvic puerperal thrombophlebitis must also then be given the complete evacuation of the uterus and the repair of lacerations.

*Expectant Treatment.*—The comparison between the mortality of the expectant and the surgical treatments of thrombophlebitis led us to state that the expectant treatment at present must be favorably looked upon. Now the chief dangers of septic thrombophlebitis are embolus, secondary organic changes and exhaustion.

Emboli become detached most commonly from thrombi that undergo purulent softening. Not all septic thrombi so changed give off emboli and not all emboli are fatal. Again, not all septic thrombi undergo purulent softening. We do not know what percentage of septic thrombophlebitis undergoes the favorable

thrombotic changes discussed above, but we have every reason to believe that it is high. Just as a septic exudate frequently terminates in absorption or in an aseptic connective-tissue formation, so may a septic thrombus terminate in absorption or in one of the favorable formations seen in the sterile thrombi. The frequency with which we meet phleboliths in the pelvic *x*-ray pictures should prove this point. In more than 50 per cent. of *x*-ray plates taken in Mayo's clinic for diagnosis of renal or urethral stone, phleboliths were found. If we could add to the number of patients in whom phleboliths were found the number in whom the thrombi were absorbed or had undergone organization, canalization, and softening the percentage would be a great deal higher. It would appear from these observations that thrombi in the pelvic cavity are almost general. Of course most of these thrombi must be sterile, but there can be no question that quite a number of them at one time or other were septic.

Not only the thrombus but the phlebitis as well may undergo favorable changes. There is no reason why it should not undergo the reparative changes that are commonly seen in the different tissues. The progress then of thrombophlebitis may under favorable conditions, lead to a favorable termination. If it were possible for us to find and induce these favorable conditions, a successful expectant treatment could easily be outlined. Let us see then what are the favorable conditions that can be induced.

In our expectant treatment we have to take into consideration the infecting bacteria, the thrombus and the phlebitis. If we could eliminate the infection a great element of the danger could be excluded. Infection could be excluded by the destruction of the bacteria, but in the present state of our general therapeutics, even of vaccin and antitoxin therapy, the bacterial agents of thrombophlebitis cannot be destroyed. While this is true, yet, we can to a certain extent increase the bactericidal powers of the patients' blood, (phagocytosis, opsonins, etc.) by increasing her body resistance. Herein lies the first principle of the expectant treatment of thrombophlebitis, for by increasing this resistance, we may increase greatly the reparative power of the inflamed veins and thus reduce or eliminate the danger. Of course this does not eliminate the possibility of embolism. Emboli can be detached at any time but this detachment is especially favored by increase of pressure behind the thrombosed



portion of the vessel. Such increase of pressure may be brought on by disturbance of the organs involved in the thrombophlebitis, as by motion, pressure, rubbing, etc., or by sudden increase of heart action, as by stimulation, excitement, exercise, or increase of blood pressure from any cause. Herein lies the second principle in the expectant treatment of septic thrombophlebitis. For by keeping the diseased parts at rest, the heart action and blood pressure at their even and normal level, we can easily avoid the disturbance of the thrombus, allowing it under the increased body resistance to undergo the possible favorable changes without detachment of emboli. Having these two principles in view, we can outline an expectant treatment which, while not ideal is at least rational. It consists in adopting measures to increase body resistance, to keep the parts involved at perfect rest and to keep the circulation and blood pressure at as even and normal level as possible. These measures are: A nutritious diet, tonics (cardiac stimulants to be avoided as much as possible), careful attention to the eliminating organs, sleep, avoidance of all excitement, perfect rest of the part involved in the thrombophlebitis and strict avoidance of pelvic examinations, of treatments such as douches, enemas and of such nursing at that attended with rough handling of the patient.

Such expectant treatment should give fairly good results, but septic thrombosis in spite of this treatment must show a high mortality, for a virulent type of streptococcic infection especially in a puerperal uterus, spread so rapidly along the endothelial surface of the pelvic veins that neither ordinary body resistance nor perfect rest can control it. It can easily be understood, therefore, why the surgical mind turned to surgical procedure for remedies to combat septic thrombophlebitis.

*Surgical Treatment.*—Stimulated by the success the otologist attained in lateral sinus pyemia by ligation of the internal jugular veins, gynecologists introduced a similar procedure in pelvic septic thrombophlebitis. This procedure has so far not been received enthusiastically by the pelvic surgeons. Eighteen years have passed since its introduction to the gynecological mind by Freund and only 122 cases could be collected by the writer from a rather extensive reading of the literature on this subject. As at present practiced the operation is performed through the abdominal and vaginal routes and consists in the ligation of the infected veins (with or without a phlebotomy) or

in the excision of the vein. We shall first consider these different methods and then discuss their remedial value in the treatment of thrombophlebitis.

*Abdominal Route.*—The extraperitoneal abdominal route has been recommended highly by Trendelenburg, von Herff, Lenhartz and others. This method has recommended itself especially in purulent thrombi because of the possible avoidance of peritoneal infection from septic thrombi. Even Bumm, who is strongly in favor of the transperitoneal route speaks favorably of this method for unilateral septic ovarian thrombus.(24)<sup>1</sup> But this route has objections. It requires two incisions in a bilateral involvement. It necessitates extensive dissection with danger of infection of the lymphatics. It gives us a deep wound making the veins inaccessible and therefore difficult to expose, differentiate and inspect. For this reason mistakes are not infrequent. Williams(53) in his collection of fifty-six cases shows that Lenhartz in his eighth extraperitoneal operation tied off a ureter while ligating the left spermatic vein, ligated twice the pudic for the hypogastric vein and in one of these two cases ligated also a small vein for the spermatic. Another disadvantage of this route is its high mortality. C. J. Miller(39), cites 40 per cent. mortality for the extraperitoneal and only 21.66 per cent. for the transperitoneal route. Williams collected fifteen extraperitoneal cases with a mortality of 80 per cent.(53).

The intraperitoneal route is the one strongly advocated by Bumm(11) and has more followers than any other route.<sup>2</sup> The advantages of the transperitoneal method are: The vessel can be readily inspected, traced and isolated, making it comparatively easy to decide which vessels and how far they are thrombotic and where and how to ligate or excise. Mistakes, however,

<sup>1</sup>An incision is made about 1/2 inch from a parallel to Poupart's ligament, dividing the skin, muscle and fascia. All the structures including the peritoneum are then reflected inwardly until the brim of the pelvis and the iliac veins are exposed. The exposure of the ovarian veins is easy, but that of the hypogastric veins, in case of inflammatory exudate in the broad ligament is extremely difficult. The possible injury to the ureter is also extremely great.

<sup>2</sup>A median incision is made and search is made for thickening or infiltration along the course of the ovarian and hypogastric veins. If found, the presence of thrombosis at the seat of infiltration is almost certain. In case of ovarian thrombosis the peritoneum is incised over the vessel, an aneurysm needle is passed under it and the vessel is ligated as far above the thrombus as practical. In case of thrombosis of the hypogastric vein it is necessary to draw the uterus firmly over to the opposite side, finding the hypogastric vein on the inner side of the artery. The peritoneum is divided exposing the vein which is then ligated close to the entrance into the common iliac. The median iliac, if present, should be ligated at the same time. If the ligation is high, it may, in order to expose the field of operation, demand considerable eventration with its consequent shock.

are possible even by this method, for such an experienced operator as Leopold ligated the hypogastric artery for the iliac vein (33). By this route the ureter can be kept in sight better than the extraperitoneal route and therefore injury to it can better be avoided during the operation. By this method a thorough inspection can be made of the pelvic organs, a bilateral ligation or excision and if necessary operations on the pelvic organs can be performed at the same time. Retroperitoneal infection or infection of the peritoneum itself can be discovered, that might be overlooked during an extraperitoneal operation. The mortality does not seem to be as high as in the extraperitoneal route. Williams(53) analyzed forty-one cases done by the transperitoneal route, with a total mortality of 43 per cent. while as mentioned before, in fifteen extraperitoneal cases there was a mortality of 80 per cent.

Ligation with panhysterectomy for early acute thrombophlebitis cases had been advised on the grounds that in such cases a septic endometritis and metrophlebitis usually exist. Ligation alone, by not removing the dangerous pathology, cannot relieve the condition. Opitz and Lenhartz(42) found pus in the uterus in most cases of chronic pyemia, especially in thrombophlebitis of the hypogastric vein, and therefore advise in acute cases hysterectomy with the ligation of the hypogastric vein. Latzko(30) reports thirteen hysterectomies (three without ligation) with eight deaths or a mortality of 61 per cent., which compares favorably with that of simple ligation in acute cases. Bumm(11) speaks against hysterectomy for acute cases stating that the operation is useless, but a 39 per cent. recovery makes the operation seemingly worth while to undertake.

*The Vaginal Route.*—Thrombosed veins of the uterovaginal plexus can sometimes be reached by the vaginal route. Usually only a phlebotomy is performed and drainage is established through the vaginal incision<sup>1</sup>. Taylor of Birmingham(49), who suggested the operation, reported three cases with three recoveries (1905). Latzko reported ten cases with five deaths, a total of thirteen cases with five deaths, or a mortality of 38.4 per cent.

<sup>1</sup> An incision is made over the thickened thrombosed vein, felt through the vagina and carefully avoiding the uterus. The veins are exposed, ligated if possible, the blood clots are turned out and drainage is established through the incision. A search is made through the incision for any pockets of pus about the vessel and if found an additional drainage is established. As Latzko puts it, the effect of this incision is similar to the one the otologist achieves by making the jugular skin fistula of Alexander, (49).

*Ligation and Excision Compared.*—A question of great importance in the operation is whether ligation of the vein above the thrombus is sufficient or excision of the vein between two ligatures must be practised.

The choice between these two methods depends a great deal upon the length of time from the beginning of the disease and on the seat of the disease. Ligation is the simpler, safer and easier. The results obtained by ligation are: 1. The checking of the extension of the infection; 2. prevention of metastasis; and 3. drainage of bacteria in a local area(53).

In acute cases according to Bumm(11) ligation is of no use. It should be remembered that in septic thrombophlebitis the venous wall may be involved by septic changes for a considerable distance above the thrombus, and if the vessel is tied a short distance from it, the clot that forms on the proximal end of the ligature will surely be septic(5).

As to the vessel to be ligated, some advise the ligation of the vessel involved only, others advise the ligation of all four vessels (Bumm(11) and von Bardeleben(2)).

There can be no question that excision is the better procedure in case of purulent softening of the thrombus (the excision to be done with the cautery knife). It prevents the passing of septic material into the collateral circulation, for as G. R. Noble(41) puts it, "A ligature is a poor barrier for a flood of pus dammed up behind it." But excision is exceedingly dangerous and difficult in thrombophlebitis of the hypogastriacs and common iliacs. Literature does not report such cases as far as we know. Both Bumm and Trendelenburg(29), while considering the extirpation of the veins desirable, state that it is possible only with the spermatic veins.

In a number of the ligation cases phlebotomy was performed. The phlebotomy after ligation of course is possible only in the ovarian thrombophlebitis cases and then only through the extraperitoneal route, but as Haeckel(20) justly says, "The danger of retroperitoneal infection and the imperfect drainage makes it a poor procedure." Latzko performed fourteen phlebotomies after a preliminary ligation. Ten of these cases died, giving a mortality of 71.4 per cent.(30).

It is interesting in this connection to call attention to the operation suggested by Trendelenburg for removal of emboli from the pulmonary artery. He operated twice. With the first case he failed completely. The second case lived fifteen

minutes. Sievers reported a case in which he removed two emboli from the pulmonary artery. The patient lived fifteen hours though there was no heart action noted during the operation. Kongers reported a case that lived five and one-half days and died of infection.

Comparing the mortality of the expectant and operative treatment of septic pelvic thrombophlebitis, one might justly be led to look with disfavor on the present operative procedures. But the last word on this treatment has not yet been said. If we, as a profession will give up every new surgical procedure that starts out with a high mortality, the progress of surgery will be very slow. The early mortality of fibroid operations was more than 30 per cent. and yet it is now considered one of our greatest surgical triumphs. Let us take the view that a surgical procedure that is rational must not be given up in its beginning because of its mortality. The ligation of a vein above the seat of a septic thrombophlebitis, checking its septic extension, preventing its metastasis and changing it into a local infective process is to a great extent a logical and rational procedure. But while it is logical and rational and justifies us in giving it a trial, in spite of the high mortality, we must always bear in mind its objectionable features, of which the most serious are the following.

1. Lymphatic infection may accompany thrombophlebitis or may even be its causative factor. The ligation or excision of the veins will not stop such pelvic infection.<sup>1</sup>

2. Early in the disease and even later there may be in the pelvis a number of slightly inflamed veins with small unrecognizable mural thrombi. Left undisturbed these septic foci will keep up the infection in spite of the operation. The postoperative histories and autopsies prove this.

3. In severe infections the septic phlebitis may extend far above the thrombosed portions of the veins. The ligation or excision of the vein even at a distance from their thrombotic portions may not include all the infected part or parts of the vein and therefore may not check the progress of the disease.

4. The operation itself presents difficulties that lead to serious consequences even in the hands of experienced operators. The operation requires handling of the thrombosed vessels making

<sup>1</sup>Grossman in fifty-one septic cases found fourteen thrombophlebitis cases, twenty-four lymphangitis and thirteen mixed. Thus in twenty-seven cases of thrombophlebitis there were thirteen or about forty-eight per cent. accompanied by lymphangitis. This percentage is rather high but it indicates how frequently in one's experience lymphangitis may complicate thrombophlebitis.

it possible for emboli to detach themselves from the thrombus, with all the dangers incident to such occurrences. The veins cannot always be recognized and isolated even by experienced operators. Wrong veins were ligated, ureters were included in ligation, an artery was tied for a vein by such an expert operator as Leopold, and the same surgeon was compelled to give up the ligation because of the difficulty of separating the iliac vein from the artery. Again, ligation alone is frequently an incomplete procedure, and excision is impractical in the iliac vessels. To the operative difficulties we may add the fact that usually the patient herself is a very bad subject for operation. These are the disadvantages that we must bear in mind in deciding our choice of treatment. At the same time we must remember that if the thrombophlebitis be left alone the septic vein may undergo favorable reparative changes and that the thrombus itself may undergo resolution, organization, canalization or phlebolithic transformation and thus become harmless.

*Conclusion.*—As we have said above the operative statistics do not compare favorably with that of the expectant treatment,<sup>1</sup> but better acquaintance with the early symptoms of thrombophlebitis and lymphangitis, better recognition of the pathological characteristics of the septic thrombosed vessels, and improvements in technic may in the near future give the operative treatment a great many advantages over the expectant treatment as presently practised.

With the hope of contributing to the development of the diagnosis and surgical technic of septic pelvic thrombophlebitis, the gynecologists might feel justified in utilizing this procedure in the treatment of these cases, but in what class of cases one should adopt this procedure is not easy to definitely state. So far as the writer is concerned he feels at present that one is justified in undertaking the operation under the following conditions.

1. When a thrombophlebitis is diagnosed by vaginal examination before the appearance of chills, especially in the absence of pain (lymphangitis is usually accompanied by pain). Ligation by the transperitoneal route of the two veins of the side involved or of all the four veins if both sides are involved, should be the operation of choice, for in such cases the venous infection may be localized and by ligating the veins the extension of infection may be overcome.

<sup>1</sup>The gynecologists therefore have at present sufficient reasons for being slow to give up the expectant for the doubtful surgical treatment.



2. In chronic septic thrombophlebitis when the general condition of the patient between chills is fair, when there are no coincident or complicating conditions, making the operation useless. In such cases the operation may consist of a transperitoneal ligation and in case of purulent softening and periphlebitis, an additional extraperitoneal incision and drainage. This with our present state of technic is practical only in the chronic ovarian thrombophlebitis.

3. As a procedure of last resort in any acute case unless it be definitely known to terminate fatally. While this class of cases will give a high mortality an occasional favorable result may be expected. The operative procedure will of course depend on the extent of the disease and the condition of the patient.

4. In acute cases with palpable veins, that come under observation after a number of chills with general condition between chills fair but getting gradually worse. Here, ligation of all four vessels with or without a panhysterectomy depending upon the patient's general condition, might be indicated.

5. In acute cases without palpable veins in presence of the symptom-complex above referred to and with a fair general condition. Here, for the present during the experimental stage of the operation, ligation with or without hysterectomy might be practised.

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PARK BUILDING.

#### DISCUSSION ON THE PAPERS OF DRS. FINDLEY AND SANES.

DR. R. R. HUGGINS, Pittsburg, Pa.—This subject is too interesting to let it pass without some discussion, and for fear that I may appear too enthusiastic about operation in certain instances, I would like to say that I believe there are a large number of cases that recover without operation; that we find many mild cases of septic thrombophlebitis that recover under palliative treatment. On the other hand, my own personal experience shows six cases of the severe form in the last twenty years with five deaths under palliative treatment. Having this record, it seemed I could not make it much worse, and I decided two years ago that in the next case of septic thrombophlebitis I would explore the abdomen, see what was the matter, and if possible ligate the vessels. I did this, and the patient recovered. Since that time I have had three other cases, a total of four with three recoveries.

There are only three points for discussion: the first is the diagnosis, the second, the indications for operation, and third, the technic. In regard to the diagnosis, there seems to be a good deal of doubt on the part of the medical profession as to our ability to make a diagnosis in these cases. I believe there is a picture which is almost typical clinically of thrombophlebitis in the vast majority of instances. If there is a temperature such as is portrayed on these charts, with marked remissions, varying from a high point to almost normal or below, accompanied by chills and corresponding variations in the pulse rate, when the temperature is low the patient feels well and looks fine, but when the temperature goes up, there is a corresponding rise in the pulse and an increase in the severity of her symptoms, we are justified in suspecting the presence of this variety of infection.

How are we able to differentiate this form of infection from septicemia, which is the one thing with which it is most likely to be confused? As a rule, in septicemia, we do not find the wide

fluctuations of temperature and frequent recurrence of chills. We do not have the intervals of apparent improvement, and the symptoms in every way seem more grave than in the early days of thrombophlebitis. The blood cultures in the latter are almost always negative, especially in the early stage, unless complicated by a septicemia. I believe that in nearly every case of septicemia, with the employment of good technic, the bacteria are found in the blood stream. To sum up in a case of this kind, going on day after day, with recurrence of chills, negative blood cultures, and the absence of local signs pointing to a lymphangitis or peritonitis, my belief is that an exploratory operation should be done. As to the technic of the operation, the abdomen should be opened in the midline which will give a good view of the veins and abdomen. In my experience, this had not done the patients any harm. If an accompanying lymphangitis is found, I see no reason why its presence forms an objection to operation, because there is no place in the body where infection is more dangerous, if allowed to progress, than in the lymphatics in the retro-peritoneal space. If the veins are found thrombosed they can be ligated from within more easily than by the extraperitoneal method. The abdomen can then be closed and if drainage is necessary, it is not difficult to make an extramedian incision, push the peritoneum forward, and drain behind the peritoneum to the region of the kidney, or downward into the pelvis, behind or between the layers of the broad ligament.

## THE COMPLETE ABSENCE OF MILK IN THE PRIMIPARA.<sup>1</sup>

BY  
FRANCIS REDER, M. D.,  
St. Louis, Missouri.

THE refusal of the mammary glands to respond to the physiological stimulus at the usual time after labor is so rare an occurrence and contrasts so strangely with the laws of nature that a report of three cases would probably be of some interest to this Association.

The literature on this subject is very meager. I could not help but feel disappointed when I sought to inform myself about this abnormal condition.

A delay in the lactating period, or a partial absence of the normal milk supply, or even a return of the milk after an inhibition of the glandular activity, are conditions that frequently evidence themselves and can usually be accounted for to the satisfaction of both mother and attendant. A complete absence,

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

however, during an uncomplicated puerperium in woman whose health has always been good, precipitates a problem of a rather enigmatic nature.

The causes that may bring about in the healthy woman a primitive agalactia in its extreme degree, can be found in a very youthful motherhood, where normally a deficient development in the secreting cells can be expected. It can be found in the motherhood of advanced age, where normal atrophic conditions of the gland have caused extensive cell destruction. A tendency to obesity may sometimes completely inhibit the functional activity of the gland. Furthermore, a tendency toward the masculine may seriously affect milk secretion and in rare instances be the cause of agalactia.

Physical influences, *i.e.*, emotions of sudden onset, such as fright, shock, etc., are prone to precipitate by their depressing reflex action upon the sympathetic nervous system, deleterious influences that may inhibit cell activity in the organ.

The cause of the agalactia in the three primiparæ, whose cases are appended, must be attributed to psychic influences inasmuch as there is no other discoverable factor to which the condition could be assigned. It cannot be disputed that the nervous system exerts some influence upon milk secretion. It remained to be demonstrated whether or not such an influence was direct or indirect.

The interesting experiments of Mackenzie have shown that the secretory activity of the mammary gland is not under the direct influence of the nervous system, but that the nervous stimulation exerted is upon the organs which supply galactagogues to the blood. In determining this fact, stimulation of the nerves of a lactating gland with either a weak or a strong faradic current, did not provoke an increased flow of milk, nor did it inhibit the flow of milk. Even the severing of the nerves supplying the gland produced no effect upon the normal secretory activity.

The interesting statement is ventured that no nerves are distributed to the secreting cells. This assertion is based upon the absolutely negative results from the experimentation with pilocarpine and atropine in endeavoring either to promote or to arrest the secretion of milk. This experiment, together with the nerve stimulation and the nerve section demonstration, would give convincing evidence that the nervous system has no direct controlling influences over the secretory activity of the gland.



Although the mammary gland, after having reached maturity, is associated by sympathetic influences communicated through nervous stimuli, with the functions of the pelvic generative organs, it has been shown that the generative organs exert no reflex stimulus upon the secreting function. Thus in their experiments, Goltz and Ewald found that after removal of the lumbar portion of the spinal cord in a bitch, a physiological evolution took place in the mammary glands during pregnancy with a normal secretion of milk after parturition.

A case of the destruction of the spinal cord in a pregnant woman with normal lactation following parturition is reported by Routh. The most conclusive experiment demonstrating the negative phase of nervous impulses on the mamma was made by Ribbert, who transplanted a mammary gland in a guinea-pig from its normal site to the region of the ear. During pregnancy this gland underwent the normal metamorphosis and secreted milk after delivery.

To the physiologist these experiments conveyed sufficient evidence that nervous impulses are not the principal factors in the cell activity of the mammary gland. As a result a new chapter of great pretense has dawned upon the field of physiological research. This chapter concerns itself with chemical bodies which are supposed to form internal secretions, whose method of control acts by chemic stimulation through the blood stream and also through the sympathetic ganglia.

Professor Starling has given the name "hormones" to these internal secretions. The term hormone is derived from a Greek word meaning "to awake." It seems to be the duty of the hormones to exert a stimulating or inhibitory influence upon the cell life of an organ to which it is carried. That there existed a chemical correlation between the mammary glands and the uterus and the adnexa has been long assumed.

Miss Lane-Claypon and Starling have shown that a specific hormone in the fetal tissues is the cause of the growth of the mammary gland during pregnancy, the blood stream conveying this chemic body to the gland, while Ancel and Bouin have demonstrated the arrest of the mammary gland in the pregnant rabbit after the destruction of all the corpora lutea.

Lombroso and Bolaffio attempted to disprove the fetal hormone theory by means of an experiment made by joining a virgin female rat with one in an early stage of pregnancy, thus establishing a vascular anastomosis between them, found that no

change took place in the mammary glands of the former, while pregnancy advanced in the latter. In support of this theory, however, the pygopagous twins, Rosa and Josepha Blazek, give substantial aid. Union of these twins is through a common sacrum. They possess one anus and one vulva, but there are two uteri and two vaginæ. One of the twins became pregnant. Hypertrophy of the mammary glands took place in both and after confinement both secreted milk.

The onset of lactation, after the chemic influence of the fetal hormones has brought about an increased growth of the glands, is explained on the supposition that the stimulus of the fetal hormone has been removed, that the hormone has given rise to anabolic changes, and that with the cessation of its activity, katabolic changes took place resulting in milk secretion.

Further investigations have resulted in the discovery of hormones which act as stimulants to the milk secretion. It was found that a mammary stimulant of great activity was contained in the posterior lobe of the pituitary body. The extracts of the anterior lobe, however, gave negative results. Extracts of the corpus luteum, the pineal body, the mammary gland and the involuting uterus possess positive qualities as galactogogues.

Ott and Scott, of Philadelphia, in their essay "On the Action of Infundibulin on the Mammary Secretion," were the first to show the stimulation of the mammary secretion with animal extracts containing hormones.

As to animal extracts possessing a chemic substance inhibitory on the mammary secretion, it was determined that both the placenta and the fetus harbor a specific product whose influence has an inhibitory power on milk secretion. From this the inference must be deducted that the hormones generated by the uterine contents interfere with lactation during pregnancy, and that their discharge at parturition permits the passive gland to become active.

An interesting experiment having a direct bearing upon the inhibitory influence on mammary secretion through chemic products from placenta, the developing fetus and even the uterus that are thrown into the blood stream, has been described by d'Errico, who injected defibrinated blood from pregnant bitches into lactating bitches and found that the secretion of milk was greatly diminished.

In endeavoring to glean some enlightenment from these experi-

mental problems to assist me in finding a probable cause for the complete absence of milk in the three primiparæ under my care, a likely inference could be made that the particular hormone whose specific duty it was to excite these cells in the mammary gland to secretory activity, was not generated or if generated did not possess the special stimulus necessary.

Inasmuch as the method of control for the action of hormones is also through the sympathetic ganglia, the shock which these primiparæ suffered during their severe labor, must be looked upon as a potent factor in causing the agalactia.

*Report of Cases.*—Mrs. H., delivery October 18, 1904. Primipara, aged thirty years, blonde, medium height, stockily built and muscular. Always enjoyed good health. Menstrual function normal, married two years. No miscarriage. Period of gestation free from any discomforts. Breasts never painful. No increase in size during pregnancy. Pigmentation increased in the nipple and areola. Breasts are well developed and very firm. Labor set in a few days before the anticipated time. Labor was severe and lasted about twenty-two hours. Amniotic fluid escaped early during first stage. Position R. O. P. Forceps delivery. Ether anesthesia; length about thirty minutes; child resuscitated with difficulty. Severe trauma to maternal parts. Child was placed to the breast about six hours after birth, on account of exhausted condition of mother. Thereafter every three hours by day and every four hours by night. No evidence of any colostrum. Breasts firm, not painful. No further enlargement. No evidence of milk eight weeks after birth of child. This woman was very much disappointed in not being able to nurse her baby. In the course of time she desired another baby, and being anxious to nurse it, measures were instituted one year prior to conception with the hope that the condition might be corrected. The breasts were subjected regularly to gentle massage. Electricity was also applied at regular intervals. The best of foods was given, and a sojourn to the seashore and to the mountains was enjoyed. Three and a half years after her first child was born, she was again pregnant. The breasts did not show any change under the treatment. They did not enlarge and remained rather hard. The period of gestation was free from discomfort, and the patient enjoyed excellent health. Labor and delivery, however, proved just as severe as at the first birth. Position L. O. P.; escape of amniotic fluid very early during first stage. Forceps delivery under ether anesthesia. Child required considerable attention. Maternal parts severely traumatized. Child placed to breasts three hours after birth. No colostrum. Eight weeks after labor no milk. No complications during puerperium. Nothing unusual in the history of her mother, who gave birth to two children.

Mrs. B., delivered June 2, 1906. Primipara, aged twenty-six years; brunette; medium height; well developed; always active. Never seriously sick. Menstrual function normal, excepting severe pain a day or two preceding the flow. Married three years. No miscarriage. During the first four months of pregnancy, nausea and vomiting; feet and ankles slightly edematous. Urine contained a slight amount of albumin; urinary salts in excess. Breasts well developed. No increase in size during pregnancy. Only slight pain occasionally. Pigmentation increased in the nipple and areola. Labor started about one week after the anticipated time. Vertex presentation. As labor progressed the position was made out to be R. O. P. Amniotic fluid escaped during first stage. After eighteen hours, during which time the pains were satisfactory, the patient began to show evidence of weakness. The following three hours no perceptible progress was made. Forceps delivery. Ether anesthesia lasting about twenty minutes. Child easily resuscitated. Maternal trauma severe. The child was placed to the breast four hours after birth. Regularly, every three hours by day, and four hours by night, thereafter. Breasts did not enlarge after labor. No colostrum could be expressed from the glands. No evidence of milk six weeks after the birth of the child. The breasts have remained the same in size. No complications during the puerperium. This woman has not been pregnant since. There is nothing unusual in the history of her mother, who gave birth to five children.

Mrs. W., delivered December 12, 1911. Primipara, aged thirty-two years; brunette. Above average height; splendid athletic build. Always enjoyed excellent health. No menstrual disturbance. Married two years and six months; later became pregnant. After fifth month feet and legs began to swell. Urine contained, at times, considerable albumin and urinary salts in excess. Pigmentation increased in the nipple and areola. Breasts painful and enlarged. Labor was severe and lasted about twenty hours. Amniotic fluid escaped shortly after labor had set in. Breech presentation. Delivery with forceps under ether anesthesia, lasting about thirty minutes. Difficulty in resuscitating child. Vaginal tear extensive, involving bowel. Child put to breasts about four hours after birth. Regularly thereafter every three hours by day, and every four hours by night. A small quantity of colostrum in both breasts was noticeable until five days after delivery. After that it was impossible to express any colostrum. No milk appeared and six weeks after labor all hope of the gland secreting milk was abandoned. There was no complication during the puerperium. Mother had a family of five children, and nursed all up to the weaning time.

DELMAR BUILDING.

## DISCUSSION.

DR. HUGO O. PANTZER, Indianapolis.—Without wishing to enter on a philosophical consideration of this subject, I desire simply to mention what is of interest in a tangential way. The *Zent. für Gynék.* within the last year contained an article by a Hungarian author who had investigated the reason why the breast tissue does not atrophy from disuse, in individuals who do not give birth to a child until very late in life and who yet have functioning breasts. He asks, why does not the tissue of the breast atrophy from disuse as do other tissues during disuse? His investigations tended to show that there was a regular stimulation of the mammary glands at every monthly period.

DR. REDER (closing).—I made as thorough inquiry as possible. As to the history of these patients with reference to the mammary glands, there was absolutely no enlargement; in two of the cases the breasts were well developed, and there was no pain. In the woman whose breasts were enlarged, colostrum was obtained up to the fifth day. It was impossible to get colostrum from the breasts of the other two women.

SOME MORAL AND ETHICAL ASPECTS OF FETICIDE.<sup>1</sup>

BY

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IN recent years much wrong doing has been exposed in almost every walk of life. Mismanagement, abuse of privilege, and betrayal of confidence are some of the evils that have been perpetrated in the judiciary, the legal, the municipal and corporate bodies of our country. When exposed and investigation instituted, it almost invariably developed that the evil had existed for years and had been handed down from predecessors. It required some particularly atrocious transgression of the law or the energies of some ambitious muckraker to bring the existing wrong to light.

The medical profession with few exceptions has always been above suspicion, because as a class its members are honorable, self-sacrificing and above all, they enjoy the confidence of the laity. Through the energies of the medical profession the world is better physically to-day than at any previous time, and it has done wonders in a moral sense by its crusade in the prevention, control, and cure of venereal diseases.

There is one criticism of the profession, however, that can be

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

made; and that is the attitude which a large number of the medical fraternity hold to-day regarding the life of the unborn child.

The laws of the land allow the profession almost unlimited power in administering the health of the people, and it can be truthfully said that never has the medical profession abused that privilege. Equally elastic are the laws concerning the induction of abortion, practically the only restriction being the consultation of two or more physicians. It cannot be honestly said the medical profession is at all times as careful when considering the life of the unborn child as it should be. Not that its members wilfully destroy life, but their teaching and moral aspect of the subject is not always in keeping with its otherwise high standard.

That abortion occurs in a large percentage of all gestations is well known and an accepted fact. That this percentage is increasing is also apparent to those whose work is obstetrical and gynecological. So general has abortion become that it is one of the most serious problems confronting us to-day. There was a time when the induction of abortion was a serious matter, and the oath of Hippocrates referred to it particularly. While it is true that abortion has been practised at all times, yet the prevalence of the crime to-day is so great that it seriously effects the health and welfare of our people.

A careful consideration of the moral aspect of feticide brings prominently to our attention several facts.

First, the large number of abortions that are performed is becoming a serious menace to the health and welfare of our people.

Second, such termination of human life is a most serious matter and every possible safeguard should be taken to restrict it.

Third, there seems to be a gradually increasing tendency on the part of the laity as well as the profession to take advantage of the law and teaching which permits and sanctions the induction of abortion.

Fourth, in most medical colleges the student has no positive teaching on the moral aspects of abortion, and he is allowed to work out his own ideas with regard to the ethical aspects of it.

Fifth, there is a gradual loss of respect for religious teaching which has always condemned the taking of the life of an unborn and unbaptized child as a sin and murder.

Sixth, many, if not all, the members of this association are teachers and leaders in obstetrics and gynecology in their respec-



tive communities and the responsibility of this teaching rests with us.

When discussing abortion as the termination of life we frequently are met with the statement that there is no life until a certain period commonly termed "quickening." It is surprising how prevalent this idea is, even among the profession. In this day of advanced thought and enlightenment it should not be necessary to present arguments as to the exact time when the fetus is animated by its own specific principal of life—its human soul. Modern scientists have demonstrated that from the very moment of conception, the human embryo is animated by the same principal of vitality that animates the man. Fortunately there are very few who still cling to the teaching of Aristotle, that the rational soul is not infused till the fetus is sufficiently developed to receive it. He and his disciples taught that we first lived a vegetative life, then an animal soul supplanted the vegetative principle, but the human soul was not infused into the body until the fortieth day for a male and the eightieth day for a female. Today such belief is contrary to all facts and reason.

At one time our laws recognized a fetus either as *animatus* or *inanimatus*, but such a distinction is not based on biologic teaching. A newly born babe has a legal standing not accorded the child *in utero*. No one is allowed to take a human life for any reason whatsoever, except the officers of the state, when after legal process a life is declared forfeited because of the commission of a crime. However, before a verdict is rendered and sentence pronounced, the accused is always given an opportunity to defend himself and state his side of the case. The child *in utero*, however, is helpless, for the law allows its life to be sacrificed under certain conditions and in most states no distinction is made as to the viability of the fetus, although in some states the punishment is greater when the operation is performed after quickening. There is assuredly no biologic or common-sense foundation for such statutes, and their enactment is another evidence of the antiquated and inconsistent laws of our times.

However, in every statute on this subject there is a clause which states that abortion is allowed only if "necessary to preserve the life of the mother." Unfortunately the privilege has been made so flexible that frequently the slightest indisposition of the mother is used as a pretext, and the life of the fetus is terminated with the conscience-satisfying excuse that it

was "necessary to preserve the life of the mother." Such subversion of morals for the sake of sentiment is a reflexion on our intelligence and is contrary to law and order. If the unborn child had attorneys to represent it at the courts of justice there would be a higher regard for its life which at present is almost a negative factor. To commit a person to an insane asylum in most states requires the sworn and certified statement of at least two physicians, both of whom must have had at least five years graduate experience. Another method of committment is by court action of a lunacy commission. As the unjust committment of a person would render the physician subject to law-suit and heavy damages, the members of the medical profession are extremely careful in signing such documents. If the same safe-guards were taken when the question arises as to taking the life of the child *in utero* the physician would exercise the greatest caution, and as a result many innocent lives would be saved which are now sacrificed on the altar of "necessary to save the life of the mother."

Let us consider the arguments that are advanced by those who sanction abortion. They claim (1) that the life of the mother is more valuable than the life of the future child; (2) that no moral wrong is committed; (3) that the fetus threatens the life of the mother and is therefore an aggressor; (4) that the removal of the fetus will save the mother, and (5) that medical authorities recommend rather than condemn the operation.

The physician has no legal right to judge and decide the relative value of different lives, neither is he a public executioner, but he usurps such power when he takes the life of the fetus. If the unwelcome presence of an illegitimate child and the attending social disgrace threatens the life of an adult member of the family, would the physician be justified in destroying that child and so save the life of his adult patient? Or would the physician be allowed to kill every syphilitic or every tubercular patient who cannot or will not be removed from his surroundings where he is a positive menace to the lives to those around him? Where will the sentimental moralist draw the line?

Klarmann in his book published in 1905 says: "Abortion is a violation of the law of nature and involves the death of a human being, and it is also a violation of the positive law 'Thou shalt not kill.' The moral aspect of abortion must therefore be determined by comparison with the fundamental rules of morality, that is, with the commandments of God, the voice of conscience, and

the common consent of the human race." Many people are under the impression that arguments opposing the induction of abortion are founded solely on religious teachings. A consideration of the different aspects of the subject would soon demonstrate that such is by no means the case, for it is a question of natural law, of physical development and of common justice.

Even the law does not allow one individual to take the life of another except in self-defence or when protecting the life of another from an unjust aggressor. The responsibility for the child's presence in the womb rests with the parents—the child had no choice in the matter—therefore it cannot be called an unjust aggressor. If the physiological placing of the fetus results in a pathological condition to the mother, surely the child cannot be blamed as an unjust aggressor and therefore be destroyed.

In the light of our present uncertain knowledge of the toxemias of pregnancy we cannot always state positively that the mere presence of the fetus is the cause of the existing pathology, neither does the removal of the fetus effect a cure in all cases.

Not infrequently it is advised to empty the uterus when conditions arise that threaten the life of the mother, as for instance, in eclampsia. We know with the nonoperative plan of treatment many such patients recover. It is equally true that with emptying of the uterus the patient dies in a considerable number of cases. (Zweifel's statistics show that about 20 per cent. of the cases died under the expectant plan of treatment, while about 12 per cent. died under active treatment. (Zweifel, *Zur Behandlung der Eklampsie, Zentralblatt für Gyn.*)

Another therapeutic indication for the induction of abortion is excessive vomiting or hyperemesis gravidarum. It is extremely difficult to define what actually constitutes the so-called pernicious vomiting of pregnancy. In many instances it is the patient rather than the condition that is pernicious, and the physician should be extremely careful in all cases to make the differentiation. Many patients knowing that the induction of abortion is countenanced by the profession will purposely simulate and prolong the vomiting and distress, knowing that in the end the physician will probably rid her of her unwelcome progeny. Under no other circumstances would the intelligent physician allow himself to be so duped and to be the tool of an unscrupulous patient.

Some may object and say that such views place ethics and

morality above medical teaching and science; but in view of the confusion and contradiction among the opinions now held regarding this subject, even those who object must admit that medical knowledge covering the toxemias and dangers of pregnancy is far from an exact science. A recent writer has stated that there must be fundamental principals in morals as well as in medicine, and the fundamental principal of the moral practice of medicine should not be to take life even if by taking one life another may be saved, and that the moral law in such cases surely is more important than the uncertain medical teaching of a few.

There is another phase of the matter, although it may seem foreign to the subject of this paper, and that is the indifferent attitude of the members of the profession when the subject of the termination of pregnancy is broached by a patient. While he would scorn even the suggestion of performing abortion himself, the physician does not do his full duty unless he indicates to his patient the great physical danger she risks by having the pregnancy terminated, and while not an expounder of the gospel, he should as a conscientious, moral physician clearly tell his patient that the interruption of pregnancy is nothing short of absolute murder, and as a practical argument, he can unhesitatingly explain the great physical harm that frequently results from self-induced and criminal abortion. Our medical journals always contain articles on the importance of prophylaxis, care, and treatment of disease, but very little is written on the saving of life by pointing out the danger resulting from abortion.

I am safe in saying that almost every physician is frequently asked by some of his patients to give medicine or treatments to rid the womb of its unwelcome contents. Not a few of these unprincipled persons even ask for the direct performance of abortion by the physician. It is equally true that scarcely any reputable physician would do such a thing, but unfortunately we are frequently told that while the physician himself refused to do any direct criminal act, he would tell the patient how abortions are sometimes performed. In this way he thinks he is doing a favor for his patient while he himself assumes no moral or legal responsibility. Nothing could be more erroneous, for even the statutes declare such a physician guilty of a criminal act, and morally, he would be guilty also.

There are many women who do not seem to appreciate the great seriousness of the offense of criminal abortion. Like many others they believe that up to a certain period in the

development of the fetus it has no rights as a human being, and that they have the right and privilege to destroy it if they so desire. They see the apathy toward induced abortion on the part of their neighbors, physicians, and the world at large, and are led to think lightly of the offense. If they were told that causing a miscarriage intentionally is a violation of the law to be punished on conviction by confinement in the state prison, they would pay little heed to the declaration, for they know that the law is seldom enforced, especially when a woman herself commits the crime. Most women are ignorant of the morbidity almost sure to follow an induced abortion, and they do not realize the tremendous danger of infection, nor the liability to sterility or a serious operation, if they survive. All these facts and considerations should be constantly held up before the woman by her medical adviser, for, knowing such dangers many women would undoubtedly hesitate before undertaking such a dangerous procedure.

In his paper on "The Premature Interruption of Pregnancy," read before this society in 1907, Lyons suggested that before abortion is therapeutically induced the advice of one or more well-informed obstetricians should be obtained, and the advice of the coroner's physician and the consent of the health commissioner's office may well be added. Whether such precautions would be practical or not is a question, but at any rate in proper hands, it would give the fetus more legal rights than it has at present. There is a gradual awakening on the part of sociologists and economists to the importance of this subject, but as in most matters which concern the public health and welfare, the real responsibility rests with us who have devoted our studies and our energies to the question of generation. It is a duty that we owe the public, our patients, ourselves and our profession, to demonstrate these moral and physical truths, for often our arguments would have more weight than any philosophical, economical or religious reasoning.

To the great credit of the modern obstetrician it can be said that by the improved technic of Cesarean section, symphysectomy and the other conservative operations, hundreds of children are being born who otherwise would be victims of such horrible mutilating operations as craniotomy, embryotomy, etc. The brilliant results, the low mortality, and the lessened morbidity of Cesarean section are so pronounced and so well known to us all that statistics need not be given to show that it is no

onger the dreaded operation of thirty or forty years ago. Indeed it is a rare thing now to hear of craniotomy on the living child, and the one who does such an elective operation to-day, especially with modern facilities and hospitals at our command, is not worthy of the honor the name physician confers.

It is the exceptional teacher and writer on obstetrics and diseases of women who properly instructs his students on this important subject; more often the contrary is true and his lectures abound with references and explicit directions as to when and how pregnancy should be terminated. Is it any wonder then that the student graduates from the class room with little or no moral instruction and goes forth to follow in the steps of Herod in the slaughter of the innocent. I repeat, that much of the responsibility rests with us as teachers and writers; that it should be a matter of conscience with us, and that we are not true to our noble calling unless we teach our students to have a sincere regard for the life of the unborn.

Gynecological and obstetric literature can boast of very few articles treating of the moral aspect of feticide, but the few references I have found are so in accord with the present discussion, and were so ably written by masters in our profession, that I need not apologize for quoting from their contributions on the subject. Bacon, in discussing the legal responsibilities of the physicians (Chairman's address in the section on Obstetrics and Diseases of Women, A. M. A., 1906) states: "In deciding on moral responsibilities, however, the physician may have great difficulty. The statute law is frequently behind or at variance with the ethical law and the variance seems to be marked in this case. Many operations would be legally safe that would be undoubtedly wrong. It is difficult to deny to the human fetus the innate right of every human being, the equal right of life. On the protection of this moral law the child *in utero* must chiefly rely for its preservation. The moral responsibilities of the physician for the child *in utero* are greater than his legal responsibilities. It is hard to dispute Pinard when he holds that neither the father, the mother, the physician, nor any other person has the right of life or death over the fetus. The frequency and boldness with which that right is claimed by the father or by the relatives of the mother should meet with firm resistance. I see no grounds on which the physician can stand when he decided to destroy the fetus, except a kind of *implied* authorization by the state which agrees to



uphold the right of the mother to self-preservation when her life is endangered by that of the fetus."

In this connection I wish to quote from an address delivered by Dr. Edw. Ill, before this association in 1908. "Neither can convenience, professional courtesy, actual suffering on the part of the mother, nor social disgrace ever be an indication for what to me would be a most horrible crime, the murder of the defenseless. I have no doubt that what has happened to me has happened to all of you who are working in this chosen part of the practice of medicine. We are called upon to induce an abortion for hyperemesis long before the mother has reached that stage when her life becomes endangered, simply because the family have forced the attendant to the wall with their sympathetic wailings, or because the attendant himself has reached the end of his resources. His patience and his sympathy have run away with his reason, or if we shall express ourselves less charitably he has become tired of the case but feels that he cannot give it up to another. I can sympathize with him, for I know of no more aggravating condition, where for weeks our efforts are little more than comforting, but I cannot consent to be a party to the destruction of unborn life, so long as the mother is not in absolute danger, and until I have personally used all resources at my command, which includes treatment away from home and systematic trained nursing. Not that I think that my professional friends cannot do equally well, but my conscience must be quieted, and I must personally have failed in the endeavor. With a large experience and much patience, I have thus far never been obliged to empty the uterus previous to the viability of the fetus, and I have never seen the mother die. Many cases have given me sleepless nights, as I often felt that the mother was nearing that brink where the uterine contents must be interfered with. I am sure that many more children should be saved. The frequent deaths of the unborn, as caused by the regular profession legitimately must ever remain a sign of weakness and impotence of an otherwise noble and humane profession."

I do not infer by these remarks that the moral tone of the medical profession as a body is low, for never in the history of medicine was the moral sentiment so high as to-day. In spite of the fact that criminal abortion is increasing, I maintain that the practitioners of medicine in general are too honorable and respect their noble calling too much to resort to practices so

abhorrent to every moral instinct. They value their reputations and love their work too truly to jeopardize their honor by resorting to such vile practices as criminal abortion. A few medical men may stoop to this crime but the real propagators of the evil are midwives, nonlicensed doctors and women themselves.

The wonderful possibilities for improvement which can take place in this humane aspect of the physician's work are incalculable. The results may be slow but I feel convinced that here perhaps more than anywhere else, is the opportunity for us as teachers and leaders in our chosen work to demonstrate the powerful influence for good that we can exert. It should be the steadfast aim of every upright citizen to do all in his power to prevent the great moral and physical crime of abortion and race suicide which is sweeping over our country. To accomplish this purpose, it requires the concerted action not only of the clergy but also the members of the medical profession, whose attitude in the matter should never be half-hearted or wavering, but ever positive, steadfast, absolute.

I appreciate the fact that in discussing this delicate subject my views are at variance with many whose opinions and teachings are accepted by the entire medical world, neither will my arguments have much weight with those who unfortunately have lost one or more of the so-called "desperate" cases, but I contend that where one mother is lost, hundreds if not thousands of innocent lives are sacrificed. I plead for a more humane view and consideration of the rights of the innocent unborn child.

714 JENKIN'S BUILDING.

#### DISCUSSION.

DR. ROLAND E. SKEEL, Cleveland.—I am glad that the author in his last two pages modified his previous remarks somewhat since all which preceded might be considered as a tirade against the medical profession for carrying out the induction of abortion and premature labor even when performed under the belief that they were necessary to save the life of the mother. No man in the State of Ohio has raised his voice oftener than myself against the practice of *criminal* abortion, but it must be regarded as a very unfortunate thing indeed that a theological view-point has been allowed to enter that which should be a calm scientific consideration of a serious medical problem.

As scientific men we have just one thing to consider. Is there a dead line which exists when the time comes that the mother's life seems really jeopardized by the presence in her uterus of an

unborn fetus? If we believe that this time does sometimes come I ask you to put the question to yourself whether you would let your wife *and* unborn child die or try to save one, the mother, at the expense of the other, the fetus.

Under these circumstances there could be but one answer to the question and all the theological sophisms which might be introduced would not suffice to change your opinion in the slightest.

The real question at hand is whether such time ever comes and at present the great majority of us believe that it does, but only time and unprejudiced consideration of the subject in a scientific manner by scientific men will suffice to definitely determine whether our belief is correct.

Every man should teach that criminal abortion is wrong, always wrong, but with our present knowledge the legal removal of the fetus from the uterus is entirely justified when we believe the mother is likely to die without such interference for if the mother dies both die and such interference no law based upon theological ground can ever prevent.

DR. EDWARD J. ILL, Newark.—This subject is one which is very close to my heart. When I was president, fifteen years ago, I spoke for the rights of the unborn, and at that time I said the unborn fetus should, under certain circumstances, have a representative in a court of justice. After practising medicine for thirty-seven years, and the special branch in which we are so much interested for twenty-seven years, I have been forced to produce two abortions. I confess that I have had many a sleepless night about many other cases, but they came out all right and I never lost a mother and never lost a fetus. As I understand the paper, the author is not questioning the right of the practitioner to induce abortion in certain cases in which it is indicated, but what he wants to impress upon our minds is this, that we are not to kill the fetus, except for the most stringent necessity, and there is certainly no need for it in the vast majority of cases in which it is done. Let us be honest about it and look the question fully and fearlessly in the face. There is a little hospital of sixty beds in my neighborhood. They do more abortions in that hospital, for trivial cases, in a month than I have done in all my life. When I read the paper I have spoken of, one of my good friends said, "Your paper would have made a much greater impression on us if you had not been a prominent member of the church." I am no prominent member of any church; they are all alike to me. This is a matter of conscience, and conscience is a matter of education. Conscience is also a matter of public opinion. With rare exceptions, you will be able to get an American court or jury to condemn a criminal abortionist. We all know that we have tried it for years. All of us have tried to have these fellows convicted. In my city we have one man sentenced to seven years of penal servitude. This was four years ago. He is still out. Nobody dares to place

him where he belongs. Prominent people do not want this man hurt, no matter whether they are church people or not. They do not believe that the fetus has a soul in its body at the moment of conception. If it has a soul, it is there at the moment of conception, and that fetus has as much right to live, unless it endangers the life of its mother, as you and I have a right to live, and the State is in duty bound to protect us before we are born. The State has not done it. The Church has not succeeded in doing it. It is going to be simply a matter of education.

DR. J. HENRY CARSTENS, Detroit.—Dr. Weiss asked me to discuss his paper, and I told him I might say something on it that he would not like. I should like to ask Dr. Weiss if he ever saw a woman die as the result of pregnancy from vomiting, eclampsia, or some similar condition.

DR. WEISS.—I have seen them die from eclampsia.

DR. CARSTENS.—From uncontrollable vomiting.

DR. WEISS.—I have seen them die if the uterus was not emptied, and by taking these patients to a good hospital, they got well.

DR. CARSTENS.—They often die. I have seen a number of them die from the uncontrollable vomiting of pregnancy. I have seen them die from progressive kidney trouble before they even had puerperal eclampsia. There is no doubt at all that once in a while a woman will die who is pregnant if that child is not removed.

As to the question of abortion. Every teacher in this country warns his students against it. As a teacher, I resent the aspersion cast on the teachers of obstetrics, namely, that they do not teach students it is a crime to commit abortion. I say they do. In the State of Michigan, we have a law bearing on this point. No one has a right to commit an abortion unless there has been a consultation of two physicians, and if they agree that a woman cannot have a child without greatly endangering her life an abortion can be induced. I think it is right to interfere under such circumstances. I for one will not sit by the bedside of a woman and see that woman die. If I cannot save both lives, I save one. But I fully agree with Dr. Ill that abortion is rarely indicated.

DR. MILES F. PORTER, Ft. Wayne.—I have not lived as long, nor have I had the experience that my friend Dr. Carstens has had, but during the time I have lived I have had considerable experience and on two occasions I have produced abortions, and I know as well as I know the sun will shine to-morrow morning, I did it because I did not know any better. I never saw a woman die of uncontrollable vomiting of pregnancy, nor have I one iota of proof that a woman's life is saved from eclampsia because her uterus is emptied. I have seen women get well after the uterus had been emptied, and I have seen them die after the uterus had been emptied. Again, I have seen other women with eclampsia die after the uterus was emptied by natural forces. Any prac-

itioner would empty the uterus in such cases if he thought he was going to save his patient's life by so doing, but I cannot tell when that time comes, and I am not yet acquainted with the doctor that can. We have no better statistics on the saving of life from uncontrollable vomiting of pregnancy or from eclampsia than those that have been published by some of our European friends, and I am sorry I cannot mention the names of the men and the institutions in which they work. I think Edinburgh is one of the places I have in mind. We know they have discarded the notion that it is necessary to empty the uterus when a woman has vomiting that cannot be controlled. Let me give you the history of a case. This woman aborted three times. She came under the care of a practitioner who was formerly my assistant. The case was studied very carefully for a short time, and I suggested that the woman be given 20 grains of desiccated thyroid three times a day. This was done and she left the hospital inside of a few days. If you can demonstrate that the poison is being generated in the uterus, it is well to remove the child by emptying the uterus, but unless you can do that, you have no right to do it, and personally I have not had the evidence offered to me, nor have I seen it in a convincing form.

DR. JOHN NORVALL BELL, Detroit.—In reference to what Dr. Porter has said, I have had the actual experience of seeing in consultation a patient with the uncontrollable vomiting of pregnancy, where there was not the slightest doubt she could not control the vomiting. She was not trying to get rid of the child. I saw her twice in consultation, and both times advised emptying of the uterus. They dilly-dallied, and finally called in another specialist, and he in deference to religious views said he would dilate the uterus slowly, but not empty it. This he did, and the woman died.

In another case, I had the woman under observation myself. She vomited and vomited. I was the fourth physician who had seen the case. She kept on vomiting, and I called another physician in consultation who was of the same religious faith as this woman and her people. He finally conceded that there was nothing to do but to take the patient to a hospital and empty the uterus. This was done, the uterus was emptied, and when the operation was completed you could not feel the pulse at all. By auscultation it counted 160. She was given salines, put back to bed, and got well promptly.

DR. PORTER.—Did you make a postmortem examination on the first case?

DR. BELL.—No.

DR. CHARLES L. BONIFIELD, Cincinnati.—I simply want to make one remark in connection with this discussion. When a man who does surgery makes a diagnosis of ectopic gestation, he immediately opens the abdomen and removes it. Once in a great while under favorable circumstances an ectopic child goes to term and is delivered alive, but this happens so seldom and

the danger to the mother of carrying an ectopic to term are so great that operators the world over ignore the rights of the child. In the toxemia of pregnancy, the majority of mothers will get along alright under appropriate treatment, but there are cases when the life of the mother is so jeopardized by the presence of the child *in utero* that we must ignore the life of the child. I have not been so fortunate as Dr. Ill. I have had these women die in the hospital under my care and I have worried over them more than any other class of patients. The attendant to be worthy of the name of doctor must do something to save the mother. Like Dr. Carstens, I do not like the insinuation that we do not teach our students not to produce abortion. I always deliver at least two lectures on the evil consequences of induced abortion.

DR. L. F. SMEAD, Toledo.—I want to take exception to the statement that there is no scientific way of determining whether a patient with pernicious vomiting is in a serious condition or not. Any of you who have followed the work of Williams, Young, Stone and Wolf, know something about the ammonia coefficient, due to altered metabolism. The ammonia is increased in toxic vomiting. There is only one exception, and that is starvation, acidosis, which you may have in the vomiting of pregnancy. Starvation acidosis can be easily diagnosed from true toxemia by the administration of bicarbonate of sodium given intravenously or by mouth. Within a few hours the ammonia will drop to normal in these cases of toxic vomiting. Where you have an ammonia coefficient, which is in excess of 10 per cent. and it continues to increase and increase in spite of eliminative treatment and rectal nourishment, you are dealing with toxic vomiting. I have seen two women with pernicious vomiting die. Only recently we had a case in the hospital of a woman, three months pregnant, who had been vomiting for several weeks. We found the ammonia coefficient 8.8. We advised the induction of abortion. The woman refused on account of religious scruples. The ammonia increased to 32 per cent. The woman died, developing jaundice just before death. We found we were dealing with acute yellow atrophy of the liver or true pernicious vomiting. The woman's life I have no doubt, might have been saved if she had aborted early. In any of these cases of true toxic vomiting, you can ascertain from the ammonia coefficient, where it exceeds ten and increases, in spite of eliminative treatment, abortion is the only thing to do.

DR. GORDON K. DICKINSON, Jersey City.—I want to say a word or two with reference to thyroid extract. Since I have been using it I have not seen a case of death from pernicious vomiting, nor have I had to empty the uterus. The sheep's thyroid gland does not contain as much arsenic as the human, consequently it may be wise to add to the thyroid extract a moderate amount of arsenic if you give it.

I am trying with all of my effort to fight tuberculosis in our



state, and I have ordered several times in consultation the emptying of the uterus in cases of tuberculosis which were advancing. There may be those who differ from me in this regard.

DR. MAGNUS A. TATE, Cincinnati.—I am one of those who believe that criminal abortion is on the decrease and not on the increase, as was stated by one of the speakers.

I cannot understand how any educated physician would make such a statement as has been made here, that there is no kind of case in which he would induce abortion. In this connection, I want to recite briefly a case in which I induced abortion this past year, and I was justified because I saved a woman's life.

Thirteen years ago this woman lived in Cleveland where she had her baby, going to full term. She developed a mild Bright's disease during the pregnant state, which persisted. It was almost nine months following this delivery before she was able to be up and around and the sight of one eye was permanently lost.

The baby died about three months after it was born. A period of thirteen years elapsed when she again became pregnant.

When I saw her about the second month she had some albumin in the urine. I carried her along as well as I could until she reached the sixth month, when I thought it advisable to take her to the hospital because I wanted to try the Fisher salt solution.

She was given the Fischer salt solution, thyroid extract, arsenic and tonics at various times without effect. Her condition was pitiable. Her hands and feet were at least five times as large as normal, also her whole body was swollen. She was blind in the right, and the left eye was very painful and vision blurred. An oculist was called in, who made a careful examination and gave his opinion that if she was not relieved she would be totally blind in the course of ten days. Her urine was loaded with albumin, almost solid. I called in two physicians as consultants, and we all decided the woman would die unless delivered promptly. At the time I operated she was in a state of low muttering delirium.

Abortion was induced and that woman to-day is up and around but she still has dimness of vision in the left eye, but her oculist assures me there is a daily improvement. In this case I think I did my duty as a physician and I feel proud of the result.

DR. RUFUS B. HALL, Cincinnati.—The discussion hinges largely on the matter of sentiment. Everyone in my hearing believes that it is correct under the conditions narrated by the last speaker, when there is no other way to save the mother's life, to induce abortion. It is not only our duty, but we should for humanitarian reasons be compelled to do it. Both the mother and child would die, and there is no appeal from it. Let us take the case reported. There was no appeal in that case because the woman would have died if the uterus had not been emptied. In inducing abortion you lose the child, but you save the mother. I have been engaged in the practice of medicine for forty years,

and during that time I have produced abortion under these conditions but twice. In each instance there was consultation, and in each instance I am confident I saved the mother's life, but I sacrificed the life of the child. We ought not to allow sentiment to carry us away in this matter. Dr. Tate saved this poor woman who is blind in one eye from being blind in the other. We should try to save life at all times. There are cases that should be carefully weighed, we should balance them up, do our duty, and then save the mother's life and sacrifice that of the child when we must.

### SOME COMPLICATIONS OF UTERINE FIBROIDS DEMANDING EARLY DIAGNOSIS AND IMMEDIATE OPERATION.<sup>1</sup>

BY

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WHEN one recalls the lines of practice that existed with reference to uterine fibroids some twenty to twenty-five years ago, and considers how relatively innocent they were then considered to be, how medical and nonoperative lines of treatment were considered adequate and sufficient for all classes, save those where interference with delivery of child during labor, serious hemorrhage or the expulsion of a peduncleated fibroid into the vagina with torsion of pedicle and sloughing existed, he is inclined to wonder whether the above title is not somewhat overdrawn.

Yet, during the last decade, this subject has been studied exhaustively by gynecologists the world over, and so much has been said and written upon the pathology, complications, degenerations, and surgical technic of uterine fibroids, that it would seem as though almost the last word had been said and that our knowledge of the condition was full, comprehensive, and along correct lines of thought. This is so, to a very considerable extent, and in the main the treatment of this condition at the present time constitutes one of the bright and illuminating chapters in surgical gynecology, for no operations which we perform are more classical, exact and productive of better results than those designed for the cure of this condition. To be sure, there yet exist differences of opinion as to whether all uterine fibroids should be subjected to operation. Such difference

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

of opinion is legitimate and proper, and perhaps will always exist, or, at least, will continue to have weight until the complications of this disease are studied and considered to such an extent that their importance will completely overshadow in its serious aspect the relatively moderate risk attached to operating upon the uncomplicated disease. For it is to a very considerable degree in the complications and degenerations of fibroids of the uterus that we have our serious menace to life.

My excuse for writing this paper, and reporting the cases which I wish to bring to your attention, is that in a somewhat exhaustive perusal of the great amount of literature upon this subject, one is struck by the paucity of reports of cases which by reason of the sudden or serious character of the complicating conditions require careful and, if possible, exact diagnosis and immediate operation, and belong to the class of urgent, or to use a stronger term, emergency surgery. According to Noble, in his study of 2274 cases, complications and degenerations existed in 68 per cent. of the number, leaving only 32 per cent. of uncomplicated cases. Those of other authors, as well as individual observations in our everyday work at the operating table, tend to confirm this high relation of complicated to uncomplicated cases, and when we consider further that later on many of the uncomplicated cases will take on complications and degenerations, and be lined up on the dark side of the history of uterine fibroids, we are not only impressed by the serious aspect of the disease, but that in this great percentage of complicated cases there must be some where the complication constitutes a grave, serious, and *sudden* menace to life, and unless met by thorough and immediate surgical relief, will go on to the death of the patient in a relatively short space of time. It is this class of cases that I will have to do with rather than that great class of complicated fibroids which require operation, but where it can be done at the election of the surgeon or the patient; or that class where operation is done simply to forestall future trouble.

The following case represents perhaps the most serious and urgent type seen in the history of uterine myomata.

Mrs. H. (Ref. by Dr. Jacobus, Millbrook, N. Y.) Married; age forty-five; a strong, vigorous woman, full-blooded, and so far as she knew, in perfect health. Mother of one child, twelve years of age. Menstrual history regular and normal until two years ago when it became more frequent, prolonged, and somewhat excessive, and as usual with the laity was considered to be due to the onset of the menopause. Upon the

morning of August 8, 1909, while in her usual robust health, and totally unconscious of any impending disaster, she was attending the morning service at church when she became faint, nauseated, and developed severe pain in the lower part of abdomen, and had to be assisted from the church and to her home. She was seen at about 12 M. by her physician. Her condition then was marked by severe abdominal pain and tenderness, persistent nausea and vomiting, rapid pulse rate, subnormal temperature, pale face and mucous membranes, sighing respiration and great restlessness, which taken into consideration with history of irregular menstruation, led to a diagnosis of ruptured ectopic gestation, with severe hemorrhage. The patient was treated by rest, elevation of the foot of bed, ice-bags to lower abdomen, morphine, adrenalin, etc., with the hope of quelling the hemorrhage and overcoming the shock, until about 7 P. M., of the same day, when by reason of no apparent rally, and evidences of continued hemorrhage as shown by increasing paleness of mucous membranes and skin, rapid feeble pulse, etc., I was called to see her in consultation.

The patient was in such desperate condition when seen, which was about eight hours from the onset of trouble, that it was impossible to make a satisfactory examination, but that a hemorrhage of a severe grade existed in the abdomen and pelvis, was evident from the history of the case, her symptoms and evidences of fluctuation in the flanks, and a doughy feel in the culdesac, and while making the vaginal examination one could indistinctly feel some small uterine fibroids, although the abdomen was too tense and tender for any satisfactory bimanual examination. Patient was prepared for immediate operation at her home, the condition being too serious to warrant any delay or removal to a hospital. Intravenous and subcutaneous salines were administered during the course of operation. Trendelenburg position. Incision revealed abdomen partly filled with blood. Multiple subperitoneal and interstitial uterine fibroids of small size—none larger than a hen's egg—and the source of the hemorrhage was found to be a ruptured artery which coursed over the summit of the largest fibroid. This vessel was still bleeding at the time of operation. Artery ligated, and as the patient had rallied some from the salines administered, a radical supravaginal hysteromyomectomy was speedily performed. She made an uneventful recovery.

This case illustrates a type of severe and serious complication which could hardly be anticipated and necessitates speedy operation in order to save life. I have scarcely a doubt but that the ruptured artery had not bled continuously during the eight hours intervening between the onset of trouble and the operation, else the patient would have succumbed from hemorrhage, but that it was bleeding at the time of operation was evidence

of how easily it could reopen and continue the hemorrhage, probably due to the well-known early arterial degeneration and sclerosis in the vessels of uterine fibroids.

While it is not my intention to deal in this paper with the exhaustive subject of uterine fibroids complicating pregnancy, I shall report the following case as depicting a condition requiring speedy operative intervention to save life.

Mrs. R. (Ref. by Dr. Goodell, Rhinebeck, N. Y.) Age, thirty-one. Married. Patient had severe neurasthenia eight years ago, which was fully recovered from. During that time there had been some uterine disease, exactly of what character is not known. For past three years health had been good, menstruation regular, twenty-eight-day type, and normal in amount. The *last* menstrual period occurred on October 7, 1907. Was married seven days later, October 14, 1907. In about three weeks patient began to have morning nausea and vomiting, increased development of breasts, darkening of areola, etc., and of course suspected she was pregnant. Everything proceeded smoothly until December 25, 1907, when she began to have sharp intermittent pain in the left iliac region, which was increased by exercise or the erect position. Day by day the pain increased in severity, gradually extending over the entire lower abdomen, pelvis and back. It lost its intermittent character and became continuous and agonizing, so that anodynes in considerable quantity were required to produce sleep at night—and indeed were required throughout the day. Persistent and uncontrollable vomiting developed, associated with rapid pulse rate, and a temperature varying from 99° to 102° F. Patient was referred to me for examination, and, if necessary, operation. January 22, 1908, exhausted and shrunk from pain, vomiting, fever and inability to sleep, her condition seemed one of extremis. Examination revealed uterus enlarged to above pubis, and there seemed to be a large hard mass posterior, and to each side of uterus. The desperate condition of patient and the great amount of abdominal tenderness upon bimanual examination precluded the making of a satisfactory examination. But it was believed to be a pelvic tumor complicating pregnancy and incarcerating the uterus. A moderate doubt as to the pregnancy being intra- or extrauterine existed, as it was quite impossible to accurately differentiate the organs. Immediate laparotomy performed. Uterus found to be pregnant and enlarged to size of a three months' gestation. It was found to be incarcerated and held down into the pelvis by a subperitoneal fibroid, which had sprung from the anterior surface of uterus, 1 1/2 inches from fundus. This fibroid resembled a sausage, and was 5 1/2 inches in length and had a diameter of 3 inches, and was attached to the anterior surface of uterus by a pedicle about 3/4 inch in diameter and 4 inches long. This pedicle had permitted the fibroid to migrate

to the posterior surface of the uterus, and when seen at operation it was lying transversely across the pelvic cavity, locked under the sacral promontory, and held in that position by an imbedded subperitoneal fibroid, about the size of a hen's egg, situated upon the posterior surface of the uterus, just above the internal os. The long pedicle of the fibroid which originated upon the anterior surface of the uterus was holding down the fundus and had imbedded itself in a distinct groove. Myomectomy was performed, both the anterior and the posterior fibroids were removed, and the wounds in the uterus carefully sutured. The abdomen was closed. Patient rallied nicely. Morphine was given to prevent uterine contractions, and she did not miscarry but made an uneventful recovery, and at the expiration of pregnancy, after an uneventful labor, she was delivered of a perfectly normal living child.

It is a well-known fact that subperitoneal fibroids originating from the supravaginal portion of uterus do not usually give rise to serious complications during pregnancy, and ordinarily adopt themselves to the changed conditions, but here we have the unusual condition of a sausage-shaped tumor, which by reason of a long pedicle had migrated and locked itself under another tumor upon the posterior surface of the uterus and under the sacral promontory, thereby causing impaction and incarceration of the growing pregnant uterus.

Norris (Kelley and Noble's Gynecology, Vol. II, page 110) reports three cases of posterior subperitoneal tumors causing impaction and incarceration of uterus, by becoming locked and adherent under sacral promontory. In all three cases myomectomy brought the case to a successful termination without the interruption of pregnancy. One could readily imagine, that seen early in pregnancy, such a case might be relieved, and the impaction overcome by bimanual manipulation and forcible replacement. But when seen late, and after impaction has taken place, and the rapid growth of both uterus and tumor are threatening the life of mother and fetus, one is impressed that the shortest and safest route to a successful issue is through a myomectomy which is performed skillfully, quickly and without undue exposure of uterus or abdominal organs. And though making this statement I am thoroughly a believer in the fact that myomectomy upon the pregnant uterus has a very limited field of usefulness, and should never be performed except in the unusual and life threatening conditions which render such operative procedure obligatory. When performed the operation should be limited to the tumors which are actually at fault,



and no attempt made to rid the uterus of other fibroids, which for the time being are innocent.

One of my early experiences in abdominal and pelvic surgery was the case of Mrs. G., a type of case very familiar to you all, and yet one that, unless met by speedy and proper surgical relief, may soon terminate fatally. This patient was referred by Dr. Mackenzie of Millbrook, N. Y. Age thirty-eight. Married. History of prolonged and excessive menstruation for past year, but otherwise health good. Had a ruddy face and was able to do hard and laborious work. She was suddenly taken with a severe uterine hemorrhage, and passed—by actual measurement—about three pints of partially clotted blood. Hemorrhage continued in milder form for the succeeding days. Later evidence of a severe septic condition appeared—chills, high fever, sweating and gradual onset of stupor—the result of exhaustion from hemorrhage and sepsis. When seen in consultation four days from the onset of trouble, the patient was *in extremis*, with pulse rate almost imperceptible and ranging from 140 to 160. Color of face almost like marble in its paleness. A hasty examination revealed a sloughing fibroid, about the size of a fetal head, which had been extruded into the vagina, and its circulation completely shut off by torsion of the pedicle, with resulting gangrene of tumor. Tumor was very readily removed, and without an anesthetic, as patient was practically beyond any keen perception of pain. Salines, intravenous and subcutaneous, and the various postural, medicinal, and dietetic measures, used under such circumstances of anemia and sepsis, were carried out, and she made a good recovery and is strong and robust at the present time.

This type of case is well-known and requires no especial notice before this organization, and when recognized early should seldom cause sacrifice of life.

Somewhat allied to the last case, though vastly more difficult to diagnose and carrying a greater risk to life, are those rare cases of suppuration of subperitoneal, interstitial, or intraligamentary fibroids. The following case represents a fairly typical instance of suppuration in an interstitial fibroid, with its difficulties of diagnosis and urgent need for operative intervention.

Mrs. S. J. V. Age sixty. (Ref. by Dr. Howell White, Fish-kill, N. Y.) Patient had always been a frail, weak woman, and throughout life had been subject to stomach symptoms and constipation, with flatulency, distention, etc. Menstrual life somewhat irregular, an occasional intermenstrual period, and for years prior to menopause, which occurred at the age of fifty, somewhat profuse. Mother of three children and the labors had been uneventful. November 20, 1910, patient noticed a hard tumor in hypogastric region, just palpable above the pubes,

and as she was an exceedingly thin person, with lax abdominal walls, the palpation and recognition of the tumor by the patient was very easy. At the time the tumor was discovered, the patient began to feel badly and have chills at irregular intervals, followed by fever of a varying intensity, profuse sweating, loss of flesh and pain in lower abdomen and pelvis. With the onset of these symptoms there was a very rapid growth of the tumor and when seen in consultation December 1, 1910, it reached to the umbilicus. Thus in a period of ten days, during which there had been severe symptoms of a septic character, the tumor had enlarged from a point just palpable above the pubes to the umbilicus. It was smooth in outline, had a rather soft feel, like a pregnant uterus, and its greatest width was at the top or umbilical portion. Abdomen moderately tender, vaginal and bimanual examination determined that the tumor was uterine in character. Blood examination revealed moderately increased leukocytosis and a differential count showed marked increase in polynuclear cells. Patient was emaciated, shrunken, and vomited occasionally, and had the appearance of one in marked sepsis. A diagnosis of probable suppurating uterine myoma was made from the history of the case; that is, the past menstrual history, the present condition of evident septic infection, and especially the rapid growth of the tumor, coupled with its rather soft and semifluctuating feel upon palpation and bimanual examination. Immediate operation disclosed a large nonadherent uterus, the size of a six months' pregnancy, and of exactly that shape. With the abdomen open, distinct fluctuation in tumor could be obtained. A supravaginal hysterectomy was easily performed without rupturing the abscess, care being exercised by not using any forceps in delivering the tumor through the wound. After its removal, and at the completion of the operation, the tumor was opened and found to be a great abscess located in the posterior wall of uterus, and containing 2000 c.c. of pus, which had resulted from the suppuration of a uterine fibroid. The walls of this great abscess cavity were thinned out to about the thickness of thin blotting paper, and it was very apparent to those present that a rupture of the abscess could easily have occurred prior to operation and precipitated a fatal outcome, and that its removal without rupture had largely been providential, and partially as a result of the provisional diagnosis of intrauterine suppuration.

When one stops to consider this case, rather rare and unusual as it is, he is impressed with the fact that a diagnosis prior to operation is not so difficult, if, previous to onset of suppuration, a uterine tumor was known to exist. And this knowledge, coupled with the rapid increase in size of tumor, the marked evidences of septic infection, chills, fever, sweating, leucocytosis, etc., should lead one to an early and fairly certain diag-

nosis, except in those cases where by reason of a great amount of abdominal fat, examination is rendered very difficult and uncertain. But even in these cases one who is alive to the many and varied complications and degenerations of fibroid tumors of the uterus will not often be misled.

Why tumors of this character undergo such suppurative changes is beyond the scope of this paper, and we can only infer that an infection from the uterine cavity, a thrombophlebitis, or both, may have been the causative factor in interfering with the circulation. It is to be hoped that such original lines of investigation as are being carried on by Sampson (*Surg., Gyn. and Obs.*, Vol. IV, No. 3) and others will give us increased knowledge of the blood supply of these tumors, and hence greater ability to determine the reason for some of their complications, especially those of a circulatory character.

The following case represents a condition somewhat similar to the last case, although not advanced to so great a degree of infection.

Mrs. H. Married. Age forty-nine. (Ref. by Dr. Jacobus, Millbrook, N. Y.) Mother of two children, the younger of which is eighteen years of age. Has had perfect health throughout life. Menses regular (twenty-eight day type), seldom painful, but for the past several years profuse and prolonged. Had no knowledge or suspicion of having a pelvic tumor and no examination of pelvic organs had been made. By reason of absence of menstrual periods of October and November, 1911, patient became alarmed lest she was pregnant, and resorted to remedial measures of a medicinal character, to bring on the menstrual flow. December 22, 1911, was taken with severe pain in the lower abdomen and pelvis, and as it was intermittent in character and there soon developed a profuse flow of dark clotted blood from the vagina, she believed that her remedies had been effectual and that a miscarriage was taking place. The pain and hemorrhage increased in severity day by day—anodynes were required almost constantly. When seen in consultation Dec. 29, 1911, seven days from the onset, she was anemic and exhausted from pain and excessive hemorrhage—chills, fever and sweating were prominent symptoms, and patient looked and acted septic to the extreme—abdomen, especially below the umbilicus, rigid, distended and extremely sensitive. Notwithstanding the extreme tenderness a large hard mass, about the size of a cocoanut, could be felt to the left of the uterus, and attached to it, and the attending physician was satisfied that this mass had *rapidly increased in size during the past week*. A moderate amount of peritoneal fluid was demonstrable by dullness in each flank which disappeared upon changing patient

to the side. Peritonitis of a marked degree was present, and that some serious intraabdominal catastrophe had occurred was evident. The exact nature of the lesion was not positive, but it seemed to rest between a tumor with strangulation, or a ruptured ectopic gestation, complicating a condition of uterine fibromata, for it seemed quite certain that the tumor to the left of the uterus was a fibroid. Ruptured ectopic gestation was considered by reason of the menstrual history, sudden onset of pain, uterine hemorrhage, etc. An immediate laparotomy was performed. Peritoneal cavity contained a large amount of blood stained serous fluid. Mild grade of peritonitis, affecting the pelvic and infraumbilical portion of peritoneum, was found to be present. The cause of the trouble was found to be an embedded subperitoneal fibroid, the size of a small coconut, which had become necrotic, and was rapidly softening and infecting the surrounding area. The fact that the tumor was not pedunculated, but was embedded into the muscularis, renders the cause of this serious complication quite uncertain, although it is reasonably probable that the circulation to the tumor may have been seriously impaired by the action of the remedies taken by the patient, under the mistaken idea that she was pregnant, to produce abortion, with resulting thrombophlebitis in the vessels of the tumor, and with secondary microbic invasion from uterine cavity. A hysteromyomectomy was performed and patient made an uneventful recovery.

When one considers the history of this case, the profuse and prolonged menstruation for several years past, sudden development of severe and persistent pain, onset of uterine hemorrhage, *rapid increase in size of a palpable uterine tumor*, and associated chills, fever and increased pulse rate, with a developing peritonitis, one is impressed by the fact that a correct diagnosis should have been made prior to operation.

In reporting these cases I am quite conscious that I have added nothing new and original to the knowledge of this well-known and thoroughly studied disease, and that the members of this Association are thoroughly competent to diagnose and treat with exactness these emergency complications of uterine fibroids, I am assured. But with the great advance that has been made during the past two decades in the science and art of surgery, and the relative safety of present day operative methods of treatment, I am convinced that we should impress upon the profession at large that a great percentage of uterine fibroids degenerate or become complicated sooner or later, that usually the operation for the cure of that condition can be done at such time as surgeon and patient elect, but that a small percentage of complications are of such a serious and urgent

character as to require immediate operation in order to save life. To give that early operative relief one must be thoroughly versed in interpreting symptoms, both objective and subjective, in association with these cases, in order to make accurate diagnosis and institute proper surgical treatment.

295 MILL STREET.

## SOME OF THE REASONS FOR ADVISING EARLY OPERATIONS FOR FIBROID TUMORS OF THE UTERUS.<sup>1</sup>

BY

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IN considering this subject one ought to take into account all of the complications arising in the life history of these tumors, which extends over a long period of time, usually from ten to fifteen or even twenty years, also the suffering and the semi-invalidism entailed. To do so, however, would be impossible in the short time allowed. Therefore, only a few of the more acute complications and conditions will be considered, the others will only be mentioned, but the writer hopes to evoke a discussion of the subject, for that is the object of all our work here, to exchange views and thereby arrive at the facts.

The profession to-day is not united as to the correct advice to give these fibroid patients. This is not to be marveled at, when we take into consideration the long clinical history of the natural life of a fibroid, extending as it does over so many years, in many cases with comparative comfort of the individual, as well as the traditions and the teaching regarding the treatment by the older writers, which until recently was palliative only.

All physicians know that comparatively little can be accomplished by medicinal and hygienic management, except to render temporary relief. For this reason we see these cases going from one physician to another, not infrequently taking treatment for months together, then changing to another until they have gone the rounds of five or six or more in the vain search for relief, but always with the same result, hope deferred. Later there develop threatening symptoms demanding immediate attention, if the life of the patient is to be saved.

It is not difficult now for the physician or the gynecologist

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

to decide what that particular patient should be advised to do. She must be operated and under the most favorable conditions. But in the great majority of the cases, however, the symptoms are not so severe nor threatening, and the patient can be made fairly comfortable for an indefinite time by palliative means. In such cases should the tumor be removed, or should it be left alone until serious symptoms develop? This is one of the most important problems of the day for the gynecologist to solve. I believe that this question can be solved in time, by carefully studying the life history of this disease. By doing this and making a record of the complications which frequently arise in or about these tumors and are clearly caused by their presence, I do not mean one examination or treatment for a year or two, or a report from one or two doctors, who treated the case early in the history of the disease. They always report that the patient is fairly comfortable, which is correct. What I mean, is to follow the case from the first physician's report to the end of the disease, then you will have a fair and correct picture from which to base an opinion.

In this way the profession can be given the facts about the fibroid disease and the complications and dangers which may arise, just as they have in appendicitis, gall-bladder disease, and various other intraabdominal affections, regarding which the profession has changed its views and treatment in the past few years. I am glad to note that the profession is coming to realize more and more the fact that there are real dangers to the patient who is a subject of fibroid disease, even though the case has pursued a mild course for years.

What are some of these dangers? They are many and varied, including:

*First*, secondary changes in the tumor (cancer).

*Second*, heart symptoms.

*Third*, pyosalpinx and suppurating ovary.

*Fourth*, ovarian hematoma, with infection of its contents.

*Fifth*, torsion of the uterus.

These call for early relief, but there are many others not so urgent, which I shall mention later.

*First*.—In speaking of secondary changes, I will refer only to cancer, as it is the most urgent of the many secondary changes occurring in these tumors. Malignant disease is much more frequent than was generally believed a few years ago even by the specialist. Taking a large series of cases numbering more than



5000 operated by different surgeons, cancer was found to be present in from 3 per cent. to 8 per cent. of all the tumors removed. The writer is of the opinion, judging from his own experience, that the latter figure is more nearly correct. With these facts before us, does it not point a way for prevention of that dread and deadly complication?

*Second.*—The frequent association of heart disturbances in cases of long-standing uterine fibroids has attracted the attention of the profession and especially of the operators, for years. The number of cases showing heart disturbances is very large, amounting to 40 per cent. in late cases. This is out of all proportion as compared with a like number of surgical risks in any other disease excepting goiter. This condition is too constant to be a mere coincident. The exact relation between the two has not been determined. It will require patient and careful effort to do so, but some one will accomplish it. Whether the heart disturbances are due to the chronic anemia from the long-continued loss of blood, or some toxic influence caused by the tumor, or some associated product of the same character that caused the fibroid disease, is all speculation, yet the fact remains, however, that we are continually meeting with these cases. They are factors not to be ignored or considered as trivial, but on the contrary they are to be regarded a very serious handicap to the patient at the time of the operation. It has been shown by Baldy's report in the records of the Gynecian Hospital in Philadelphia, as well as the experience of a large number of other careful observers that they are the direct cause of an increased mortality after operations.

*Third.*—Pyosalpinx with suppurating ovary is a frequent complication in long-standing fibroid subjects especially in married women. While this condition is not so frequent in the higher walks of life, yet it is a factor that one must always reckon with. In public hospital work in which the cases come from the poor and less informed, the presence of a suppurating tube and a large suppurating ovary is very frequent, in the experience of the writer reaching as high as 15 per cent. of all cases that apply for relief. It is perfectly easy for one to demonstrate by the clinical history that the pyosalpinx and suppurating ovary are a recent condition, commencing at a certain definite time and pursuing the usual course of the disease as seen in patients who are not the subjects of fibroid disease. That the presence of a suppurating tube or ovary is

a serious and dangerous complication, adding to the mortality after the operation which these patients are now compelled to submit, is a fact that no operator will dispute, therefore, we must always reckon with these as a serious complication that may come to many of the fibroid cases.

*Fourth.*—Ovarian hematoma with infection of its contents is a serious and dangerous condition not infrequently encountered. The writer has met with this complication in quite a number of cases. He has observed it only where the fibroid tumor had been known to exert for many years, and the tumor occupied the pelvic cavity as well as extended well into the abdomen. Only one ovary, as a rule, is involved and usually contains from 4 to 6 ounces of old blood clot. All of these cases give a history of having had several attacks of pelvic peritonitis. The fibroid fills the pelvic cavity full and under this is located the involved ovary. The condition upon examination is not unlike a fibroid complicated by pus tubes, so far as all the physical signs are concerned. This complication has been met with almost exclusively in the unmarried, in whom it was perfectly easy to exclude infection, *via* the vagina. The writer believes that the ovary becomes imprisoned in the pelvis during the progress of the growth of the fibroid, and because of the pressure upon the imprisoned ovary the bleeding takes place into the ovary during each menstrual period, extending over several months, sometimes as many as fifteen. The ovary thus distended by blood and lying just in contact with the rectum, the infection takes place by the colon bacillus finding its way into the blood clot. By careful examination the colon bacillus was found to be the cause of infection in all of these cases.

*Fifth.*—Torsion of the pedicle of fibroid tumors is not an infrequent accident and calls for early operative interference, yet the symptoms are not so urgent as those caused by torsion of the uterus, which serves as a pedicle for the tumor in some of these cases. When this occurs the strangulation of the tumor is complete. While this is not a frequent accident, it is of such a grave and dangerous condition that it is of vital clinical importance and well worthy of mention in this connection. In each instance in the writer's experience the fibroid was about the size of a four or five months' pregnant uterus, and attached to the upper segment of that organ. In the three cases in which this condition was encountered the patient had known of the existence of the tumor for several years, but as

the symptoms were not severe, they had been advised by their physician not to do anything until the tumor caused severe symptoms. The clinical history of the acute attack in each case was so like that of a ruptured tubal pregnancy, that the family physician had given that as his diagnosis, in two instances believing that it was associated with the fibroid tumor. The torsion was so pronounced that in each case the entire tumor was black in color, and in two cases the strangulation was so firm that numerous hemorrhagic infarct were produced throughout the tumor mass. These cases certainly developed severe symptoms just as the patient had been advised to wait for before having the tumor removed.

The acute complications enumerated above are by no means all that are likely to occur in any given case. There yet remains to be considered necrosis, suppuration, edema, calcareous degeneration, cystic degeneration and intraligamentous development which can be easily and safely dealt with early in its history; but is complicated, difficult, and dangerous late in the disease. Ovarian cyst and pregnancy are not infrequent complications, and are always a matter of serious concern. The tumor may give no serious trouble before pregnancy supervenes and may have advanced to two or three months, when the symptoms suddenly become very acute, demanding immediate relief. Frequent attacks of pelvic inflammation, anemia due to the great loss of blood at the menstrual period, pressure symptoms interfering with the function of the bowel and bladder are also likely. The secondary effect upon the kidneys due to pressure upon the ureter is not an infrequent condition. Any of these lower the vitality of the patient, and entail additional risk to that which the patient has incurred on account of prejudice of the profession and through them the patient and her friends, to early operations. We could mention many other reasons for advising early operations but enough has been said for me to ask: What are we going to advise our patient? She comes to us knowing that she has a tumor. She can get along fairly comfortably, but she came to learn whether or not it is safe for her to go along with her tumor. She wants advice whether it would be better to have the tumor removed now while she is in good condition, and the risk accordingly small, or whether she had better wait and see whether or not several symptoms develop. Your decision is momentous to her. One cannot investigate this subject without realizing the fact that disabling

and fatal complications, directly due to these tumors or associated with them, occur with alarming frequency, and one is again and again, asking himself if he is right. Is the profession right in withholding operation so long in a condition fraught with so much danger from this delay? It is conceded by all that cases in which the tumor is causing symptoms which it is plainly evident cannot be corrected in any other way, except by removal of the growth, should be recommended for operation. But it is the larger number of cases which have not progressed so far that we are discussing now. The writer is of the opinion that after the usual palliative treatments have been given a fair trial for two or three months, if the symptoms subside and the patient is relieved and is apparently a well woman, the case is not one for immediate operation, but should be carefully watched. But on the contrary, if the symptoms continue after this preliminary treatment, and after making certain that they are due to the activity of the tumor; by which I do not mean that the tumor is enlarging rapidly, or that secondary changes are taking place in it; but in the sense that it has not become quiescent, non-active, clinically well; but is pursuing the usual course in these cases persistently progressive. In the writer's experience a large proportion of this class of cases, probably most of them, finally pass into a condition of chronic suffering and invalidism. Because of the fact that the tumor itself is a continual source of disturbance, even though it is of small dimensions, and the patient subject always to the dangers of the various complications enumerated; therefore, we should not wait until severe symptoms develop, but recommend an operation in the near future.

628 ELM STREET.

#### DISCUSSION ON THE PAPERS OF DRS. SADLIER AND HALL.

DR. HERMAN E. HAYD, Buffalo.—I have had an interesting experience which accentuates the importance of Dr. Sadlier's paper, and for that reason I will briefly report it.

I operated in May on a woman twenty-six years of age who was seven and a half months pregnant. Seven days before I saw her, her husband came home drunk and kicked her in the right side. She had complained of a great deal of pain during the previous two or three days, so that it was necessary for her to remain in bed. She could not get up nor walk on account of acute suffering. She had a temperature of one degree at night. I was called a week after the accident by her family physician and upon examination found a mass in the right side, about the size of one's fist, which was evidently attached to the uterus.

This mass was exquisitely tender. I was satisfied from the history of the case that it was probably a suppurating fibroid, as the pain did not agree with the usual syndrome of appendicitis, and for that reason I advised operation. She was removed to the hospital, and an incision was made over the appendical site, and a tumor about the size of a good big orange was delivered. I felt somewhat distressed after delivering this tumor, which was perfectly smooth and clean, to think this woman was subjected to operation, when, in all probability, no obstruction would have resulted in her future delivery. However, after the wound was sewed up and the tumor was bisected, the center contained about a teaspoonful of pus, so that it was a case of suppurating fibroid with all of its possible dangers and complications.

Another especially interesting feature was, the pedicle was small, only about the thickness of my finger. I deperitonized—separated the peritoneum—pushed it back, tied off the stump, but it kept on oozing. I took a round needle and carefully stitched the surface together, but where the needle made its entrance and exit it continued to ooze and ooze, that I was afraid to close the abdominal cavity. I tried pressure, and waited for a few minutes, and finally in my distress I simply clamped off the oozing surface with a bent broad ligament forceps. I let the forceps hang from the lower end of the wound and at the end of twenty-four hours I removed them and the pregnancy was in no way interfered with, and seven weeks after this operation the woman was delivered of a thirteen pound boy. I am satisfied that we can do a great deal of surgery on the uterus if not brutally handled when we have no toxemia, where there is no toxic condition of the blood. All of us know how serious pregnancy is when it is associated with typhoid fever. These women abort very easily and in a very large percentage of the cases. So also with an acute suppurating appendicitis abortion very frequently occurs.

DR. EDWARD J. ILL, Newark.—I have reduced the question of fibroids to an arithmetical proposition. It is said that from 3 to 8 per cent. of fibroid tumors develop cancer somewhere in the uterus; therefore every fibroid tumor should be removed. I take exception to this. Cancer of the cervix or body are incidental to fibroids, but fibroids change to cancer rarely. At Johns Hopkins, out of 1300 cases, one fibroid is said to have become cancerous. These patients come for operation because of the symptoms these tumors produce. How many fibroids extis in women, generally? Suppose we take Philadelphia as an example, and I speak of Philadelphia because in my arithmetical problem I had to deal with that City when I looked this matter up. The deaths rate from operation we will say, is as low as 3 per cent. I am presenting the lowest figure only, up to about six years ago. They had operated in Philadelphia on 6000 cases. I had looked up the statistics in various hospitals all over the

world, and the number of fibroid tumors found on the postmortem table in general hospitals in women after thirty-five was between 4 and 8 per cent. Supposing we say the average was 6 per cent. Six per cent. of all women about and near Philadelphia represent about 120,000 women. Philadelphia had operated on 6000 cases. Will you tell me what has become of the 114,000? They have had no symptoms, and they do not see a doctor, and if they had symptoms and did see a doctor, they would not have escaped operation. If we subject those 114,000 women to operation, as my friend, Dr. Hall advises, you would kill 3420. When you remove fibroid tumors for fear that cancer is going to develop, then you must consider them in the light of operative cases. If one fibroid in 1300 cases degenerates into cancer, then in 114,000 you would have eighty-seven cases turn cancerous. But to save these eighty-seven cases, you have killed 3 per cent. of the 114,000, or 3420. I leave any further deduction to you.

DR. HALL (closing the discussion).—I want to say a word or two in answer to Dr. Ill. He did not take the right cue. Dr. Ill would operate on the very cases I would operate upon. I said that if you treated these cases within a reasonable time, say two or three months, and they continued with symptoms and were not relieved, then they were cases for operation. I did not say that a large number went on without symptoms. Those who were put on the waiting list had tumors present. The day is coming when fibroid tumors will be operated upon early, and when that is done we will not see so many complications. Cancer comes in tumors that have been delayed for five and ten years without operation. These are the ones in which you get cancer in the degenerated tumor.

## THE SELECTION OF THE ANESTHETIC FOR ABDOMINAL AND PELVIC SURGERY.<sup>1</sup>

BY

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I AM impelled to the presentation of a paper of this character by two motives: The first is to bring out from an authoritative source, such as this body, a practical discussion upon the most important single factor in the average abdominal or pelvic operation. The second is to present my own conclusions based upon a very modest experience but with a hope that the paucity in numbers may be partially compensated for by the fact that each case has been the subject of careful personal observation.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



The series upon which these conclusions are based runs back only four years, at which time the hospital was completed in which 95 per cent. of my work is done, and because of the compactness of the material and the possibility of observing every patient individually, some ideas concerning anesthesia have been evolved which are assuming the characteristics of a creed.

I may be wrong in stating that two motives only impelled me to present such a paper as the present one, as it is more than likely that there is also a subconscious desire to stamp as altogether wrong the idea that there exists at the present time a universally safe anesthetic or one which under any and all circumstances meets every indication.

The short series of cases which forms the basis of this paper comprises 1120 separate anesthetics, of which 731 were for laparotomies, among which ether was the anesthetic in 582; nitrous oxide and oxygen in 128; local anesthesia in nineteen; chloroform in two.

In attempting to analyze the reason for the selection of the particular anesthetic for the particular patient in this series, some interesting facts were developed.

Local anesthesia by cocain, novocain or quinin and urea hydrobromate, either alone or followed by ether at the appropriate time, was used because the patient was in no condition to tolerate the deliberate use of any general anesthetic. In one instance local anesthesia was used for an appendectomy solely because the patient desired it. Uncompensated heart lesions, myocarditis, arteriosclerosis with very high blood pressure, profound collapse and advanced sepsis were the usual complications which led to exploration under cocain and the completion of the operation after a few whiffs of ether if necessary. With care the abdominal incision can be made painlessly under skin infiltration with a  $1/2$  to 1 per cent. solution of cocain or novocain and from  $1/10$  to  $1/4$  per cent. for the deeper structures.

There is nothing original in the statement that handling the parietal peritoneum and traction upon any of the mesenteries is painful and ligation of the mesoappendix or broad ligament is not only very painful but the patient experiences nausea, turns pale, the hands and feet become cold and there is every evidence of slight shock, with a soft rapid pulse. For this reason infiltration of the abdominal wall preliminary to full general anesthesia has not been used to prevent shock, since it is visceral handling rather than abdominal incision which is so evidently productive

of shock and our surgical methods are complicated enough now without the introduction of useless questionable procedures.

Local anesthesia plus sufficient ether to annul pain when painful or shock-producing manipulations are to be made is another procedure and distinctly a life-saving one in a few instances. The amount of ether required to distract the patient's attention from the operation and its surroundings and produce primary anesthesia is very small and the succeeding stage of excitement is absent since the patient desires to become unconscious instead of rebelling against the anesthetic. This method does not adapt itself to the hurly burly, noise and commotion of a showy or theatrical clinic but works beautifully in many instances when the patient has confidence in the surgeon and on the other hand when the surgeon's time and attention can be given solely to the patient and work in hand.

Vaginal incision for large pelvic abscess, abdominal incision for neglected appendiceal abscess, drainage of large infected gall-bladders, exploration for intraabdominal hemorrhage, intestinal obstruction, etc., when the patient is in profound collapse, lend themselves especially well to local anesthesia followed by ether only if much intraabdominal manipulation is necessary.

Ether was chosen for the routine anesthetic in all operations in the abdomen in which speed was the element of primary importance, in which perfect relaxation was necessary for good, complete work, in patients not reduced by prolonged illness and in a general way, if the lungs and kidneys were sound when safety was to be considered rather than comfort.

We well know the risks attendant upon the use of ether when bronchitis or pneumonia are actually present. It does not seem to be so clearly recognized that a latent focus of pulmonary tuberculosis may be aroused to activity or that during the prevalence of influenza, bronchitis or pneumonia in a given locality, a large proportion of the residents of that locality are exposed to the contagion of these diseases and are carrying the bacteria in their respiratory tracts. Under these circumstances the administration of a mucous membrane irritant such as ether, undoubtedly produces the requisite *locus minoris resistentiæ* and the safety ordinarily present in its administration is absent. Another anesthetic should therefore be chosen.

Nitrous oxide and oxygen were selected for a great variety of reasons first and foremost among which was the fact that a skilled and experienced nitrous oxide anesthetist was always available.

In the absence of such an expert, nitrous oxide would have had a very limited field of application. The chief indications for its use, always with the above proviso, were bronchitis and pneumonia, whether the patient was already the victim or whether they were prevalent in the community at the time. Closely following this was nephritis in a patient requiring operation and on about an equal basis were operations needing careful, pains-taking dissection and requiring a long time for their performance, although this is not common in abdominal work but applies more particularly to neck and breast dissections. Great feebleness of the patient short of actual collapse, whether due to persistent hemorrhage or prolonged illness of any sort, was regarded as one of the most positive indications for nitrous oxide anesthesia provided the conditions were not so extreme that the most rapid operation possible was necessary.

A combination of circumstances, the value of which will be discussed a little later, led to the selection of nitrous oxide and oxygen in a good number of instances in which it was not perhaps especially indicated.

The above general remark that ether was chosen rather than nitrous oxide when safety was to be considered instead of comfort, was made advisedly. For plastic pelvic procedures nitrous oxide is the most comfortable general anesthetic known, but in the face of renowned authorities I am willing to venture the opinion that it is not the safest, while for the majority of abdominal operations it is neither the most comfortable nor the safest.

Let us analyze the prevalent belief that nitrous oxide and oxygen is a perfectly safe surgical anesthetic. The primary reason for this probably lies in its unquestioned safety as a dental anesthetic. Deaths from its use for this purpose are so rare as to be negligible in spite of its daily use in thousands of dental offices throughout the country. In some manner the notion has spread that all that was required for safe surgical anesthesia was some method of continuing the anesthetic state sufficiently long to permit of the performance of operations of gravity, and that this has been accomplished by the simultaneous administration of oxygen.

Now it is probable that dental anesthesia is a combination of true anesthesia and asphyxia, lasting ordinarily but a few seconds or a minute or two at the most. We are led to this belief by the fact that the most skilful gas anesthetists use a high percentage of nitrous oxide until the patient is well under, when the nitrous

oxide is diminished and oxygen increased until such time as all jactitation is past and the patient remains quietly asleep with deep respiration, neither asphyxiated nor conscious. Incidentally allow me to interject that this requires time and a skill which is born only of prolonged experience.

Before the above condition of surgical anesthesia is reached, the patient would have been anesthetized to the dental degree, the operation would have been performed and consciousness would have returned. The momentary asphyxia would have caused no possible bad results unless in an individual whose heart had already reached the utmost limit of its endurance. Could surgical anesthesia be induced by a multiplication or indefinite repetitions of dental anesthetics, gas would undoubtedly be absolutely safe for all practical purposes, but this is not true, as in that period of time succeeding primary unconsciousness and preceding surgical anesthesia there is a decided risk of the production of dangerous asphyxia. This is especially true if the patient is difficult to anesthetize. An occasional patient is found who will proceed no farther than this primary unconscious stage and if the administration of gas is persisted in regardless of the patient's condition, it is easy to see how an immediate fatality might ensue. Once the nitrous oxide and oxygen are properly adjusted for the individual patient, however, the crisis is really past so far as anesthetic danger *per se* is concerned and its use can be continued almost indefinitely, but just at this point there arises a danger generally overlooked for an operation cannot be continued indefinitely even if the anesthetic can, and either the oxygen in the mixture or the carbon dioxide stimulation keeps the patient in better condition while under the anesthetic than after recovery from it. This often leads to undue prolongation of an operation which might otherwise have been hastened, with the result that shock comes on immediately after the anesthetic is withdrawn or after the patient is returned to bed in apparently perfect condition. The rapid return to consciousness after stopping the anesthetic contributes to a feeling of safety which is in no wise justified or logical. A person asphyxiated to unconsciousness by strangling will awaken instantly when air gains access to the lungs, but he was in great danger in spite of his rapid recovery.

Exploitation by those personally interested is, I am sorry to say, another very potent reason for the popular belief in the safety of nitrous oxide. For this the exuberance and enthusiasm of

some very prominent members of the profession are directly to blame, and I believe that could they have foreseen the results of their utterances they would have been more circumspect in what they said and wrote. Working under the most favorable circumstances with expert anesthetists they have not hesitated to proclaim the entire safety of nitrous oxide with the result that large numbers of medical men and dentists have equipped themselves with the necessary apparatus and after observing a half dozen administrations, have rushed home to announce the possibility of anesthesia without danger, discomfort during its use or uncomfortable after-effects. These so-called gas anesthetists have sometimes allied themselves with operators who found it to their interest to keep up the clamor, many times with men who will never operate sufficiently often to have an anesthetic death in their entire career, and so the fallacy has spread. One never hears the really expert experienced scientific nitrous oxide anesthetists proclaiming the entire innocuousness of their anesthetic agent. On the contrary such men are constantly endeavoring to point out the indications and limitations of this drug, but the damage has been done and will reveal itself in a bountiful harvest of deaths before the mischief is corrected. This was one of the circumstances referred to earlier in the paper in which it was said that a combination of circumstances had often led to the use of nitrous oxide when it was not indicated. For the belief of a part of the profession in the safety of nitrous oxide has in some mysterious manner found its way into the public press, and in certain communities is so strongly instilled into the lay mind that patients demand gas instead of ether, and this demand is more persistent if such patients have been subjected to previous etherization with its subsequent nausea and distress.

Certain classes of operations lend themselves especially well to nitrous oxide anesthesia. All gynecological work that is performed through the vagina is as readily done under gas as ether. Muscular rigidity is of no moment here, and after-pain is not severe in any event.

Given their choice these patients will usually choose nitrous oxide if the facts are put plainly before them including the added expense to which they will be subjected. This added expense is another source of danger since the temptation is strong to manufacture the gas instead of purchasing it. The process of manufacture is simple enough, but other products of ammonium nitrate distillation as commercially practised are poisonous and

require chemical washing to remove them from the finished product. If a competent chemist is employed to give constant attention to the apparatus and the gas, the cost is much reduced but the absence of expert supervision over gas manufacture is as dangerous as the absence of an expert anesthetist to give the pure gas.

For operations necessitating incision through the anterior abdominal wall we do not feel that patients should be given their choice. A laparotomy can be performed, an appendix can be taken out, intestine resected, gallstones removed, gastroenterostomy or pylorotomy accomplished, all under nitrous oxide, but the work is never so well or so completely done since the temptation to stop, once the primary lesion is overcome, is a strong one. Lane's kinks, combined gall-bladder and appendix lesions, adhesions in distant portions of the abdomen or pelvis are not discovered without unjustifiable force and manipulation, since the abdominal rigidity and protruding gut are always in evidence.

Barring the expense, however, there is a form of mixed ether-nitrous oxide-oxygen anesthesia which, gives the maximum of safety with the minimum of discomfort. The patient is first rendered unconscious with gas as in the well-known gas ether sequence, but instead of discontinuing the nitrous oxide, it is continued, and a very small quantity of ether added to the nitrous oxide oxygen mixture. By this method the danger of prolonged asphyxia at the outset is avoided while the very small amount of ether used is productive of no danger to the bronchi or kidneys and violent ether sickness is not frequently seen. Muscular rigidity is also avoided and the patient is saved the excruciating pain which follows pure gas and oxygen anesthesia since she dozes for some time after the anesthetic is discontinued instead of awakening immediately as after gas alone.

I wish again to emphasize the point which I made at the meeting of the Ohio State Medical Society in May of this year, that this latter method is the one which is used in those clinics whose gas anesthetics seem to be so smooth and they convey an entirely wrong impression of the true difficulties and dangers of nitrous oxide oxygen anesthesia.

While nitrous oxide and oxygen has many other drawbacks such as occasional failure to produce anesthesia, complicated apparatus, expense, etc., it has a very distinct place in the surgeon's armamentarium and should be selected more frequently than is generally done at present; particularly can it be substi-



tuted for a large number of conditions in which chloroform has long been the anesthetic of choice, but it is *not* absolutely safe, the pain after abdominal operations is sometimes exquisite, back-ache following abdominal operations is not less than after the use of ether, severe headache is common and an occasional patient vomits more persistently than after the administration of either ether or chloroform.

#### DISCUSSION.

DR. E. I. McKESSON, Toledo (by invitation).—I did not expect to participate in the discussion of this paper. I was interested to hear the experience of Dr. Skeel and to take home some new idea. The paper is so radical in many features, however, that it would require something like an hour to discuss the various topics that have been covered.

It is our custom here to check up the effects of the gas and oxygen by means of the pulse, respiration and blood pressure of the patient during operation taken every five or ten minutes, and in this way we know something of the effects that are being produced. In something like 700 or 800 prolonged cases we have found that the blood pressure does not increase or decrease from properly administered nitrous oxide-oxygen anesthesia, but the addition of ether to the nitrous oxide-oxygen anesthesia results in prompt depression of the systolic blood pressure. This means that the ether has a more depressing action than the nitrous oxide and oxygen. The same depressing results can be obtained by *substituting* ether for the nitrous oxide and oxygen. If, for instance, a patient seems to be a subject for apoplexy, if it is desirable to reduce the blood pressure, it can be readily and promptly accomplished by administering ether, contrary to the opinion that has been offered by pharmacologists, that ether increases blood pressure.

I agree fully with Dr. Skeel that nitrous oxide and oxygen is not absolutely safe. Anesthetists are not absolutely safe. There is more in the anesthetist than there is in the drug used. In the hands of a good anesthetist chloroform is safer than nitrous oxide and oxygen in the hands of a novice for abdominal surgery. But with nitrous oxide and oxygen I believe a patient is in a better condition to withstand any kind of operation, short, prolonged, or traumatizing, than he is with any other drug when given properly. For instance, not long ago I administered an anesthetic for three hours and fifty-seven and a half minutes, the case being one for resection of the descending colon and portions of the small intestine involved in a cancerous growth. The patient was in fairly good condition; his blood pressure had not gone below ninety during the four hours, and showed no post-operative depression, such as suggested by Dr. Skeel. I think

this particular case means something, and the fact that nitrous oxide and oxygen does not in itself influence the blood pressure when properly administered, is a very important feature. There are other causes for shock, both on the table and afterward, besides the administration of an anesthetic. I think we all agree as to that.

DR. WILLIAM H. HUMISTON, Cleveland.—I think Dr. Skeel has given us a very fair statement in regard to nitrous oxide and oxygen anesthesia together with the use of ether. I feel that when the deaths are published that have recently occurred from the use of nitrous oxide and oxygen anesthesia, we will be astounded. In the hospital with which I am connected there have been cases recently of death following nitrous oxide and oxygen anesthesia. These deaths have not been published. One was a simple case of appendicitis, with a short operation. The patient expired at the close of the operation from nitrous oxide and oxygen given by a man who has had considerable experience. I do not see any deleterious effect from the administration of ether, and the scientific administration by the drop method is ideal, and I do not want anything better. I have used nitrous oxide three or four times in doing abdominal operations. While I succeeded in getting through, the tense condition of the muscles bothered me to such a degree that the operation was prolonged to double the length of time that I could have done it had the drop method with ether been used.

We have not had in our service during the past six years one case of shock or the appearance of shock, and I have made many prolonged multiple operations, that is, five or six operations, doing trachelorrhaphy, repairing the torn perineum, opening the abdomen, separating adhesion, removing tuboovarian abscesses, removing the appendix and shortening the round ligaments, without the patient having any shock. Shock is due to the loss of blood, and exposure and handling the intestines, and if you avoid this, I do not believe it is possible for you to have shock. I do not refuse to operate upon desperate cases that are brought in. I do not select my cases, and I do believe that in abdominal work ether by the drop method in competent hands is the safest anesthetic we have.

DR. WILLIAM SEAMAN BAINBRIDGE, of New York City, referred to the discussion of anesthesia by the Sections on Pharmacology and Physiology, at the last meeting of the American Medical Association, at Atlantic City. Many who attended that joint session and who listened attentively, were appalled at the number of casualties presented by the honest statements of facts concerning the administration of nitrous oxide and the various inhalation anesthetics. Differences in the chemical and physiological properties of the anesthetics, or combinations and sequences of them, the influence of season and climate, the apparatus employed, the method of administration—these and many other factors exercise an influence upon the mortality.

The concensus of opinion, therefore, seemed to be that no final conclusion concerning anesthetics could yet be rendered. The need for a more thorough study of the entire subject was expressed on that occasion by the organization of a national society of anesthetists, the next meeting of which will be held in Minneapolis in 1913, during the annual meeting of the American Medical Association. Much will doubtless result from the combined efforts of surgeons and anesthetists in the attempt to overcome the difficulties which are at present involved in the problem of the administration of anesthetics.

In the speaker's own experience the preparation of the patient had proved an important factor in the question of the safe administration. The after-care of the patient materially lessened the unpleasant sequelæ of the ordinary anesthesia.

Two methods of administration deserve especial mention at the present time—the intratracheal, which is still on trial, and the vapor method, the superiority of which as compared with the drop method, may be said to be unquestionably established. Dr. Gwathmey, who has developed the latter method, has given anesthetics over 3000 times for the speaker, being able to keep the patients anesthetized an hour or longer with an ounce of ether and a dram of chloroform, by using the special apparatus which he has devised for measuring and warming the anesthetic vapor.

Referring to spinal analgesia, Dr. Bainbridge took a position between that of Jonnesco, on the one hand, who holds that spinal analgesia has no contraindications, and Murphy, on the other, who holds that it is never indicated. Lane, Waugh, and Grey, of London, claim to have reduced the mortality in certain abdominal operations, particularly in children, by employing spinal analgesia. Babcock, of Philadelphia, Morton, of San Francisco, and a number of others also used it almost exclusively in operations upon the lower abdomen. With these, and many other favorable facts in mind, one should consider spinal analgesia in relation to the question of safety in select cases, particularly in those involving operations upon the abdomen and lower extremities.

DR. SKEEL (closing).—I would like to ask Dr. Dickinson how many intratracheal anesthetics have been given for him.

DR. DICKINSON.—I cannot tell you. We have been using it for the last four or five months.

DR. SKEEL (resuming).—Ill considered statements based on limited experience embracing but a few weeks or months are responsible for much of the present anesthetic turmoil and this is especially true of nitrous oxide and oxygen as a surgical anesthetic.

The statement is easily made that this or the other particular method is safe and successful, but no one man has had sufficient experience to determine whether this is really true or not.

When such unguarded statements go out from an association

of this character a perfect epidemic of disasters is bound to follow. As I have said before there will be a bountiful harvest of deaths if members of the profession do not cease giving out the misleading statement that nitrous oxide and oxygen is an absolutely safe anesthetic.

To say that any man, or woman either, can take up the complicated apparatus necessary after seeing six or eight patients anesthetized and give the anesthetic safely is perfectly absurd. To witness a thousand nitrous oxide anesthetics without the practical experience of giving it himself under the guidance of an expert would not give the cue to the proper administration of this anesthetic. If it requires 16,000 ether anesthetics to produce one death, an experience of a few thousand nitrous oxide anesthetics amounts to very little when it comes to settling the relative safety of the two.

This paper was written while on my vacation which lasted four weeks and two deaths from nitrous oxide were known to have occurred in the city of Cleveland during that time. I protest that nitrous oxide is anything but a safe anesthetic in the hands of one not an expert, and I personally believe it to be much more dangerous than ether in such hands. We do not think to-day that it is safe for one to embark in the business of doing major surgery unless he has had sufficient special training to foresee and apprehend the great variety of things which may happen to interfere with the safe progress of a major operation. Years ago pioneer work without this training was necessary. Likewise no one to-day should undertake to give nitrous oxide and oxygen habitually for surgical cases until he has had prolonged experience under a man who knows how, for there are men who understand it thoroughly, just as there are men who understand major surgery thoroughly and are competent to give instruction.

In common with the rest of you I have had ether given in thousands of cases and with scarcely ever a *scare* in a thousand and I can assure you that nitrous oxide *scares* are far more frequent, and it is only when the anesthetist is thoroughly familiar both with his apparatus and the agents he is using that gas anesthetics prove at all successful.

Many of the very short operations offer particular inducements for nitrous oxide as the anesthetic as the patient is readily and quickly gotten under and recovers just as promptly with little ill feeling, but its particular advantage lies in the long operation, since anesthesia can be maintained for hours, once the mixture is properly adjusted, without deleterious after-effects and in this lies a great advantage over ether.

This agent is being widely exploited and it is being implicitly accepted by a large number of surgeons who will have many deaths unless they wake up to the fact that they must select their cases for nitrous oxide and oxygen as they have heretofore selected them for ether and chloroform, and my paper was an

effort to indicate some of the conditions which made one the preferable agent as against the other two.

DR. GORDON K. DICKINSON, Jersey City.—There is a man behind the gun in this proposition, but, at the same time, we must consider three people in the matter of operation, and the patient is a very important one. Shock is produced, as I understand it, not by the loss of blood, but by traumatism, psychic or otherwise. Every patient who goes to the operating table perturbed in mind is predisposed to shock. Crile stated it clearly when he said that the prepared patient seldom had a shock with a surgeon who is careful in his work. I myself never operate upon a person who will not go to the etherizing room with an undisturbed mind. I want him to give up, and with that condition I have not had a case of shock in six or seven years. An important thing to remember is to prepare the patients mentally for surgical work, and not allow them to be prepared by the ordinary method before operation. Prepare them on the table where you possibly can.

The other matter I wish to speak of is with reference to ether and chloroform and their administration, and that man has the best results with an anesthetic who knows his anesthetic and can give it with the least toxic effect. We give intratracheal insufflation at Christ Hospital and it works beautifully. The patients come out nicely, and we are not bothered by the after-effects. If the man who gives my anesthetics was not an enthusiast, I do not think he would have such good results. The man who loves to give chloroform, gives it well. The man who likes the drop method is successful. Gwathmey with his warm anesthetic is certainly achieving grand success, but each man must practise his method and gain success and confidence in it.

## DIAGNOSIS AND OPERATIVE TREATMENT OF THE DISEASES OF THE GENITALIA IN THE FEMALE INSANE.<sup>1</sup>

BY  
PROF. B. S. SCHULTZE, OF JENA, GERMANY,  
Jena.

TRANSLATED BY  
E. GUSTAV ZINKE, M. D.,  
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AMONG women who suffer simultaneously from diseases of the genitalia and from nervous disturbances we meet a few in whom the nervous symptoms (light psychoses included) rapidly subside when the disease of the genitalia has been removed. Sometimes the disappearance of all the nervous symptoms immediately

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

follows the cure of the genital affections, as in the reposition of a retroflexed uterus. One is therefore forced to conclude that the nervous disturbances in these cases are only symptoms of the diseased condition of the genitalia.

Such observations cause us to pause and consider whether or not in some of the profound psychical affections, the nature of which prevents these patients being at liberty or consulting a gynecologist, there is a definite relation between the psychical malady and the existing pathological condition of the generative organs. In other words: Do insane asylums contain women whose psychical condition might be improved or cured if relieved of the genital affection? That there are confined within asylums many females who have gynecologic affections has been repeatedly demonstrated and is generally accepted. Furthermore, it is certain, if the disease of the genitalia were removed, a small percentage of these cases would be cured of their insanity.

These considerations prompted me in 1880 to pronounce the following postulate: No uterine catarrh, no chronic tear, no cicatrix of an old parametritis should remain unknown within an institution for the insane.

In every case of the female insane I urged a diagnosis of the condition of the genital organs. Upon this diagnosis, I said, would depend the treatment in many cases and the results following the cure of the genital affection would prove the justification of my demand.

But few heeded my appeal of the past. Schauta in 1891, in his address before the faculty of Vienna energetically supported my demand and has repeatedly referred to it in the various editions of his "Collective Gynecology"—*Gesammte Gynäkologie*.

I have not been able to learn whether or not in any of the insane asylums of Germany or Austria the female insane have been subjected regularly to gynecological examination, followed by proper operative procedure.

For the first series of systematic examinations of the female insane for the purpose of ascertaining indications for operative treatment we are indebted to George Henry Rohe, president of this Association in 1893-1894, whose career was cut short by his untimely death. From the Maryland Hospital he selected thirty-five insane women for a special examination of the pelvic organs and found diseased ovaries and tubes in twenty-five of them besides many lacerated cervixes and torn perineï. In only eighteen of these cases did he obtain the consent of the



family or legal guardians to perform an operation; later four other cases were added to this number. Of the twenty-two operated upon, two died. The others promptly recovered from the operation and were permanently greatly improved in their physical condition. The psychical effect was immediate and permanent in four; in four other cases the effect was negative; the remaining twelve patients were markedly benefited, some of them to such degree as to render a most propitious prognosis.

A second series of systematic and expert examinations of the genitalia and operative treatment for anomalies of the pelvic organs was reported by A. T. Hobbs while superintendent of the Asylum for the Insane at London, Ontario. In a period extending over six years he examined the pelvic organs of 1000 insane women. Two hundred and fifty-three of the patients in whom lesions were discovered within the pelvic viscera were operated upon as indicated by gynecological principles. Five patients succumbed to the operation, the others recovered, the majority of whom showed a surprising improvement in psychical condition; in the course of time, 100 of the 253 cases recovered from their psychoses.

During the ten years preceding the introduction of systematic examinations of the pelvic organs and the operative removal of the diseased parts, the number of patients cured or improved was 37.5 per cent. During the five years following the introduction of operative diagnosis and therapy, the percentage of those discharged as cured or improved rose to 52.7, and notwithstanding this increase in the number of dismissals, the number of readmissions remained the same. Hobbs correctly observed: this proves not only a higher rate of permanent cure of those from whom the genital complications were removed by operative procedure, but when we consider the marked increase in cures effected it also speaks for the etiological importance of these complications.

In the same manner, Hobbs compared the psychical effect of gynecological operations and other surgical procedures upon wholly different regions of the body. During six years, he performed upon men and women of the asylum thirty-nine radical operations for inguinal, femoral, ventral and umbilical herniæ. Although there was noteworthy improvement in the physical condition of all these patients, the effect upon the existing mental malady was negative. Not one recovered.

In the last decade of the nineteenth and beginning of this

century, at about the same time Rohe and Hobbs published their interesting and important observations, numerous cases of more or less profound psychoses were reported, especially in American journals, to have been promptly cured when the disease of the pelvic organs had been removed by an operation.

An extensive theoretical consideration of this subject by MacNaughton Jones, in 1900, should here be mentioned. This great authority warmly advocated the introduction of gynecologic diagnosis and necessary therapy for all female inmates in every insane asylum. It does not appear that the psychologists of Great Britain and especially those in charge of London's large asylums have recorded successes of any kind.

In recent years several reports of a rather striking character have appeared. Women, who without observation or treatment of any kind, were removed by their husbands, and taken to gynecologists, who found involvement of the genitalia and indications for relief by an operation. The operation resulted not only in a physical but also in a psychical cure. Bossi of Genua and Schukkaert of Loewen have reported such cases.

Almost every report and treatise on this subject emphasizes in its caption that the genital ailment is the cause of the psychosis. To the psychologist and psychiatrist we leave the etiological investigation of the development of a psychosis. Strictly speaking we only know that in a number of cases the genital disease is the one link in the chain which fetters the mind and that the removal of this link liberates it. It is this realization, confirmed by experience, which justifies our claim.

For instance, we are as unable as the psychiatrist to explain why, among one thousand retroflexions of the uterus there is unquestionably one and possibly, a second and a third which enshroud a mind in darkness. Of these thousand cases of retroflexion there may be twenty in an insane asylum and among these there may be two or three women whose minds could be freed by an operation which corrects the retroflexion.

What I have just said of retroflexion is equally true of all other diseases of the female genitalia. In the majority of women the genital disease exists without mental disturbance. In asylums, too, we find that of the many women with diseases of the genitalia there are few whose pelvic maladies are responsible for the existing psychosis. It cannot be definitely diagnosed by the psychiatrist more than by the gynecologist in how many cases the relation between the mental affliction and

the disease of the genitalia is of such character that the removal of the latter would release the benighted brain. Success or failure of the operative therapy alone can determine this.

Consequently, all insane women suffering from pelvic disorders should be relieved by gynecologists.

It has been said that every insane woman should have the genital apparatus examined and if necessary operated upon before commitment to the asylum (Bossi). This can be accomplished in but few cases. The character of the insanity frequently makes a speedy commitment necessary. Some take it for granted that the genitally diseased insane women are referred to the gynecologist. This, too, is rarely done. And when an insane female, whose trouble is obviously genital, is referred to a gynecologist and operated upon, it is in all probability one of the many cases in which the genital disease bears no relation to the patient's insanity.

The psychosis remains unchanged in the healthy body. Such a case may be used to demonstrate to the laity and others that the insanity bears no relation to the disease of the pelvic organs.

The only reliable means for saving those insane women in whom the genital disorder is the closing link of the chain which fetters the mind, is that all genitally diseased female inmates of asylums should be subjected to operative treatment.

Another very important point which should not be overlooked is that the women enjoy much better physical health though their mental state could not be improved by disposing operatively of the genital disease.

We gynecologists deem it our duty to help suffering woman-kind and hence it behooves us to protect as many profoundly afflicted women as possible from a sad fate which need not be portrayed.

To accomplish this the following simple plan might be adopted; by prearrangement with the superintendent of the asylum, the gynecologist, with the necessary assistants, may visit the institution regularly, at frequent intervals, to examine the women who have been admitted in the meantime. The history should be taken and record made of the examination and diagnosis. A consultation with the director of the asylum should follow and with the physician in charge, if there is one.

Next, negotiations with relatives or guardians would be in order, for the purpose of obtaining the consent to perform the necessary operation which is based upon gynecological indica-

tions and upon the prognostic consideration for the body and mind of the patient. The operation should be performed in the asylum, so that the patient may be under observation of the psychiatrist without interruption during the treatment following the operation. It is understood that the asylum has modern and fully equipped operating rooms. Later, two or three of the operations previously determined upon, may be performed. After this a further series of well conducted examinations is made. The newly admitted patients should be examined early because the sooner the disease of the genital organs is disposed of, the better the prospect for a favorable psychical result.

The older inmates, too, should be examined and those with genital involvement should not be deprived of the benefit of an operation; because even in those who have been confined in an institution for years favorable results have been obtained through the restoration of the genitalia to a healthy condition.

There are three ways to attain the desired object:

(1) Let us continue our efforts to convince the directors of insane asylums that only a limited number of women can be brought to the road of recovery until all genitally diseased females are cured, if possible. My own efforts have not ceased despite thirty years of fruitless labor in this field.

(2) The authorities might be influenced when appointing directors or superintendents, especially in new institutions, to select men who favor systematic examination of the genitalia of the female insane, and who will insist upon the installation of the necessary accommodations for operative treatment of patients in need of this therapy. I have sought to accomplish this, but without success. When new institutions are founded a medical superintendent is usually appointed at once; he is considered an expert, and as such makes arbitrary disposition, in the way of rules, regulations and arrangements. The psychiatrist wants to be monarch of his establishment.

(3) The third way is the only certain one, as has been historically demonstrated in the United States of America and in Canada by Rohe and by Hobbs, who were the directors of their respective institutions in which the unique, unparalleled and unprecedented successful cures were accomplished by operative therapy upon the female insane. In this way and in this way alone, can we with certainty secure convincing material in great abundance. Later the other two methods may be employed with success.

It behooves every one of you, my dear colleagues, to work, each in his own state and to see to it that in cases of new appointments for old institutions and for asylums to be erected, a gynecologist who is skilled in diagnosis and also an experienced and successful operator is made director or superintendent of the entirely independent female wards.

## CONSERVATIVE OPERATIONS ON THE OVARIES, INCLUDING A REPORT ON 112 CASES.<sup>1</sup>

BY

WM. H. HUMISTON, M. D.,  
Cleveland, Ohio.

AFTER an experience of ten years in conservative work on the ovaries and Fallopian tubes, I do not believe it good surgery to sacrifice a healthy ovary or an ovary that is only partially diseased, providing the woman is not over forty years of age and there is no suspicion of malignant disease or recent gonorrheal infection.

There was a period twenty years ago when ovaries were needlessly sacrificed, because asepsis made the abdominal operation a comparatively safe one. But the neurologist and better class of general practitioners made their protests felt and this form of work, nearly or quite approaching malpractice, has been stopped.

A well-known medical man of national repute is quoted as saying that he preferred to see most of these ovaries in the abdominal cavities of women than in the surgeon's pickling jar.

Brothers states: "If the gynecologist deserves to have a place in surgery at all—and this seems to be denied him by certain large hospitals and by some surgeons—it is because of much of the work done in this particular branch of pelvic surgery. It is not the purely mechanical part of his work which justifies the gynecologist to pose as a specialist."

It will be conceded that every good surgeon should be able to do this kind of work equally well, provided his opportunities for gaining experience occur often enough. It is in the laboratory, in the clinic, and in the operating room that the student devoted to diseases peculiar to women obtains his advantage over the general practitioner of medicine and over the general surgeon. The result is a clearer insight into diagnosis, a better judgment

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

as to the proper course to pursue, and greater familiarity and facility in the technical details of gynecologic operations.

Cystic disease of the ovary is quite common and the distention gives rise to a pressure that is manifested in suffering and marked nervous phenomena. The smaller ovarian cysts may be excised and healthy ovarian stroma left that will continue to functionate.

The infected and suppurating tubes and ovaries do not offer so favorable a field for conservative work. But when unilateral, a favorable condition exists for conservatism as will be shown later on in the details of some of my cases.

The cases I tabulate here embrace the period from 1899 to 1909. The efforts I have made in the past six months to learn of the present condition of the cases and state of health since operation have met with but partial success.

Of the 112 cases in which conservative operations have been performed but seventy cases have been heard from; nineteen of this number have given birth to twenty-one children. Many have moved from the city, undoubtedly some have died, and a certain percentage consulted other surgeons who have relieved them of what was left from former operations.

Among the 112 cases I have conservatively operated upon, but three returned for a second operation.

These three cases will be detailed.

	Number
Removal one ovary, resection of other . . . . .	84
Resection of both ovaries . . . . .	5
Resection right ovary . . . . .	19
Resection left ovary . . . . .	12
Removal both tubes and one ovary resection, of remaining ovary . . . . .	1
Total . . . . .	112
Mortality nil.	

If a similar percentage of pregnancies occurred in those patients not heard from it would increase the percentage to about 28. This of course is speculative and cannot be used. But in the 19 per cent. out of the 112 cases we have a showing, convincing to a judicial mind, that conservative operations are worthy of general adoption.

CASE I.—1909. Mrs. K., age thirty-one, two children, no miscarriages. Had a phlebitis following birth of first child. Menses began at ten years of age, regular, duration two to three days. Always painful. Came complaining of constant headache, back-ache and pain over left lower quadrant of abdomen radiating down thigh.



Examination revealed partial laceration of perineum, cervix with large bilateral laceration. uterus large, tender, retroverted. Right ovary palpable, enlarged. Left ovary cystic.

Under ether anesthesia, uterus curetted, laceration of cervix repaired. Abdomen opened in median line, uterus brought forward. Left ovary size of hen's egg, removed. Right ovary sclerocystic, two-thirds of which was resected. Gilliam operation on round ligaments. Patient left table in good condition. Uneventful recovery.

*Pathologist's Report.*—Chronic interstitial endometritis, glandular hypertrophy of cervix. Cyst of left ovary. Portion of right ovary sclerocystic.

April 10, 1906. Dr. Zebold of Shelby reports that he delivered this patient of a healthy child at term. December, 1910, at Toledo, Ohio, she gave birth to second child, normal delivery.

CASE II.—1904. Miss Stella H., seamstress, age twenty-four. Menses regular from sixteenth year, duration three to six days, attended with severe backache.

She came to me complaining of severe backache and pain over left inguinal region. Pain in left hip caused her to limp, not able to stand with foot flat, but walks on ball of foot, latter being turned outward. Treated at both Lakeside and Charity Hospitals. Put to bed for six weeks with extension and weights. No permanent improvement resulted. Has had hysterical fits.

On examination found vaginal outlet relaxed, labia minora, granular (probably a masturbator). Vagina roomy, cervix normal, uterus swollen, tender, retroflexed. Left ovary prolapsed, indurated. Right ovary enlarged, tender, and under fundus of uterus.

July 6. Operation, ether anesthesia, uterus dilated and curetted. Abdomen opened in median line, uterus separated from adhesions to rectum. Left ovary sclerocystic, one-third resected, remaining portion carefully sutured with catgut. Right ovary size of unshelled walnut, contained cysts and hematoma. Ovary and tube removed. Gilliam operation on round ligaments. Recovery uneventful and was discharged August 6.

*Pathologist's Report.*—Glandular hypertrophy of endometrium. Interstitial endometritis. Sclerosis of both ovaries. Multiple follicular cysts of right ovary.

This patient improved rapidly and was married during the year. Dr. Osborn of this city reported that he attended her in confinement May 5, 1906, and she was delivered of a healthy male child at term. Convalescence normal.

CASE III.—Miss M. L., age twenty-five. Menses appeared at eleventh year of age, always painful, duration five to six days.

Since a curetment three years previously has been worse, with deep-seated pain in right lower quadrant of abdomen, extending down thigh to knee, complains of prolapse of uterus, backache and occipital headaches. Examination revealed a normal outlet of vagina, cervix conical, uterus sagging in pelvis. Both

ovaries prolapsed and readily palpable. Operation Nov. 4. Removed pessary, uterus dilated and curetted, clitoris freed of adherent prepuce, sphincter ani dilated, abdomen opened, removed left ovary and tube, resected right ovary and removed catarrhal appendix. Shortened round ligaments by Gilliam's method. Recovery smooth and prompt. Discharged Dec. 3.

Patient married after a year, now lives in Duluth, Minn., and in April, 1907, gave birth to a healthy child.

CASE IV.—Mrs. D., works in restaurant, came into hospital through dispensary service. Early history missing. Had been gradually growing worse and worn out from the suffering in lower abdomen, backache and headache. Examination shows vaginal outlet and vagina normal. Cervix in axis of vagina, slight unilateral tear, uterus retroflexed, fixed. Both ovaries prolapsed, enlarged, tender. Operation June 24, 1904. Uterus curetted, sphincter ani stretched and a few rectal tabs trimmed off. Abdomen opened in median line, uterus bound down by adhesions, separated and brought forward. Left ovary sclerocystic, removed, with tube. Right ovary cystic, punctured freely and tension relieved. Shortened round ligaments by Gilliam's method. Uneventful recovery.

*Pathologist's Report.*—Glandular hypertrophy of endometrium. Sclerosis of ovary.

Confinement Oct. 2, 1905, at St. Ann's Maternity, by Dr. H. H. Powell. Labor pains began Oct. 1, at 8 A. M. and continued to 3 P. M., no further pains until 3 A. M. of Oct. 2, when they began and continued until head was upon perineum. Ceased and then forceps were applied and a well-developed child delivered. Child did not breathe until artificial respiration was resorted to. Child died at 4 P. M. day of delivery. Patient's recovery uneventful.

CASE V.—F. W., single, age twenty-one. Menses began at thirteen, regular, duration five days, first day painful. Came complaining of constant severe pain in right lower quadrant of abdomen, radiating down thigh. Backache. Very nervous. Examination revealed nothing abnormal, except that both ovaries were prolapsed and tender.

Operation January 24, 1905. Uterus dilated and curetted, glans clitoris freed from preputial adhesions. Abdomen opened in median line. Appendix found with a constriction near base, some adhesions found, appendix removed. Right ovary cystic, removed. Left ovary punctured and tension relieved.

Recovery prompt. Discharged Feb. 20, 1905. Married in 1906 and removed to California. She returned to Cleveland on a visit in 1910 and reported that she had given birth to a healthy girl baby two years before. Is well and free from pain.

CASE VI.—Mrs. K., age twenty-seven, married eight years, one child two years after marriage. Has not been well since. Came complaining of backache, headache and a dragging sensation in lower abdomen. Examination revealed a moderate tear of

perineum, laceration of cervix, uterus large, retroverted, cavity 4 inches deep. Both ovaries prolapsed and enlarged.

Operation March 18, 1905. Uterus cureted, cervix repaired. Laparotomy. Both ovaries cystic, removed. Gilliam operation on round ligaments. Appendix removed. Recovery uneventful.

*Pathologist's Report.*—Interstitial endometritis, cystic degeneration both ovaries.

Came Sept. 1, 1908, and reports having had a miscarriage, Dr. Lowenberg attended her, fetus well formed. A portion of an ovary must have been left at time of operation, or perhaps she had a supernumerary ovary.

CASE VII.—Mrs. C. W., age twenty-eight, married two years, one child, instrumental delivery July 22, 1905. Fair recovery. Came to me complaining of being exceedingly nervous, with irregular, palpitating heart action. Pain in right groin. These symptoms all came on several months after birth of child. Had an attack of appendicitis eight months ago. Examination revealed a lacerated cervix, both ovaries palpable, enlarged, tender.

*Operation.*—Uterus dilated and cureted, lacerated cervix repaired, abdomen opened in median line. Left ovary was large, cystic, resected. Right ovary cystic, punctured and tension relieved. Appendix was found postcecal, enlarged, elongated and vessels injected; removed. Recovered rapidly and went home in four weeks.

*Pathologist's Report.*—Chronic interstitial endometritis, chronic catarrhal appendicitis, sclerocystic ovary.

Gave birth to male child Sept., 1907, normal delivery, has been well since.

CASE VIII.—Mrs. F., married, age twenty. One child, normal delivery. Secondary operation. Came complaining of constant pain in lower abdomen both sides, backache, headache, loss of appetite. About one year ago patient fell and immediately after pain developed in right iliac region, was confined to bed for two weeks. Examination revealed laceration of perineum, bilateral laceration of cervix, uterus enlarged and tender, both lateral vaginal vaults tender.

*Operation July, 15, 1906.*—Uterus cureted and torn cervix repaired. Laparotomy. Right ovary size of hen's egg, cystic, removed. Left ovary cystic, tunica thickened, punctured, appendix normal. Convalescence smooth, and went home in three weeks.

*Pathologist's Report.*—Normal cervical tissue, cystic degeneration of ovary.

Dr. Romig reports he attended this patient in confinement Jan. 28, 1909, and delivered a girl baby.

April 17, 1911. Patient came to my office to consult me for a persistent backache, headache, loss of flesh, pain in left iliac region. Examination shows partial rupture of perineum, cervix lacerated, swollen, and in axis of vagina, uterus enlarged

and retroverted, mass to be felt in left vaginal vault the size of a hen's egg.

*Operation, May 1*.—Cervix repaired, appendix removed, multiple cysts in left ovary removed.

*Pathologist's Report*.—Ovary smaller and harder than usual, and grayish in color. Follicles in all stages of atrophy and degeneration, and in some places are converted into fibrous nodules. There is a marked hyaline change in the arterial wall, and very little normal ovarian tissue left, ovary has undergone cystic degeneration. The largest cyst contains fully 2 drams of a chocolate-colored fluid.

CASE IX.—Mrs. L. J., age twenty-eight, married six years, one child, instrumental delivery, four miscarriages. Came complaining of headache, backache and severe pain in left inguinal region. Much worse when on her feet. Painful urination. Examination shows partial rupture of perineum, cervix small tear, uterus enlarged, mobility impaired. Left tube and ovary in a mass, size of small orange, painful. Right ovary prolapsed, swollen, movable.

*Operation, March 7, 1909*.—Curetted uterus, opened abdomen. Left tuboovarian abscess, adhesions firm and vascular, abscess removed. Right ovary enlarged, cystic, cyst punctured, tube congested, but otherwise normal. Recovery in usual time.

*Pathologist's Report*.—Abscess and degeneration of ovary and tube. Interstitial endometritis.

June 15, 1907. Returned complaining of pain in right inguinal region, menstruating regularly.

September 9, 1907. Returned feeling well, gain in weight, and reports absence of menses. Examination shows uterus enlarged to size of five months' pregnancy, milk in breasts. Patient moved and was lost track of.

CASE X.—Mrs. K. S., age twenty-five, two children, normal deliveries. Came complaining of cramping pains in left side, pain down thigh, these symptoms have existed since birth of last child, backache, headache, constipation, leucorrhea. Examination reveals partial tear of perineum, bilateral laceration of cervix, uterus enlarged, movable, tender.

*Operation, March 12, 1907*.—Uterus curetted, cervix repaired. Abdomen opened, right ovary cystic, removed. Left ovary hardened, thickened tunica, one-half ovary resected. Concretion found in appendix, appendix removed. Recovery prompt.

*Pathologist's Report*.—Right ovary cystic, portion of left ovary resected, sclerotic. Chronic catarrhal appendicitis.

April, 1909. Delivered of healthy female child. Dr. Williams of Collinwood attending.

CASE XI.—April 19, 1907. Mrs. M. W., age thirty, nullipara. Menses began at twelve years of age, painful every time, rather profuse. Comes complaining of pain in right iliac region, tender on pressure, pain in right hypochondrium. Had typhoid fever last year. Has not been well since menstruation first began.

Examination reveals vaginal outlet relaxed, cervix small, uterus held in place by pessary, has retroversion.

*Operation, April 22, 1907.*—Uterus cureted. Abdomen opened, left tube and ovary adherent, adhesions separated, cysts in ovary punctured. Right ovary enlarged, adherent, cystic, adhesions separated, ovary removed, tube not disturbed. Gall-bladder examined, found normal. Recovery in usual time.

*Pathologist's Report.*—Chronic endometritis, chronic appendicitis, cystic degeneration of ovary, and hematoma.

Patient recovered a good state of health. Dr. Zebold reported to me in April, 1911, that he was called in consultation with another physician to see Mrs. W., Feb. 20, 1911. She had placenta previa. Mother lived but a short time after birth of child. The child lived a few hours.

CASE XII.—Miss J. R., age twenty-three, nurse. Menses began at fifteen years of age. Irregular for a time, appeared every two weeks, latterly every twenty days, painful, always attended with systemic disturbances. Profuse flow, clotted blood. In 1906 had operation for appendicitis. Dec., 1906, patient fell down stairs, striking coccyx. The fall gave rise to a free discharge of clotted blood from uterus. Catheterization of bladder required for a time. April 23, 1907, patient again had a severe fall which aggravated all of her previous symptoms. Complaints of sharp pain in right inguinal and lumbar region, extending across to left inguinal, and being especially severe in suprapubic region. Compelled to give up work for a year. Examination revealed a small, anteflexed uterus, tender, both ovaries prolapsed, enlarged and painful.

*Operation, May 21, 1907.*—Uterus dilated and cureted, clitoris freed. Abdomen opened. Right ovary large, cystic, one-half resected and ovarian ligaments shortened. Left ovary thoroughly cystic, removed. Both tubes left undisturbed. Made a good recovery and in four months resumed her work as nurse.

*Pathologist's Report.*—Sclerocystic ovaries.

Patient married in 1909. Sept. 2, 1910, Dr. Henry Fitzgerald, Westminster, Md., reports patient three months pregnant. Feb., 1911, gave birth to a healthy female child.

CASE XIII.—Pus case. Large tuboovarian abscess.

Mrs. P., age twenty-seven. Two children, one miscarriage. Came to hospital in a septic condition, great loss of weight, sweating, chills. Severe pain and mass in right lower quadrant of abdomen. Three years ago was operated for appendiceal abscess, free incision and drainage, no attempt to remove appendix. A fistula remained which discharged pus ever since. Examination revealed a mass at side of uterus in right vaginal vault extending to region of appendix, uterus deviated to left. Patient was in no condition to stand a radical operation. Under local anesthesia with cocain, the fistulous opening was enlarged and a drainage tube wrapped in gauze inserted. Patient improved daily until Aug. 31, when she was sent home to return

later for radical operation. Her family physician, Dr. Barricelli, attended her, dressed the wound and kept it open. Returned Oct. 16, 1907. General appearance much better, had gained in weight, fistulous tract still open and discharging pus, bad odor. Pus examined and colon bacillus found.

*Operation, Oct. 17, 1907.*—Uterus cureted, abdomen opened through right rectus muscle. Extensive adhesions of omentum and intestines to a mass to right of and reaching above uterus. Omentum ligated in sections and lower third removed. The mass proved to be a large tuboovarian abscess with tip of appendix adherent thereto. With difficulty the tube and ovary were shelled out and a V-shaped portion of fundus uteri cut out with Fallopian tube and united with catgut suture. Appendix removed.

Left ovary cystic, punctured but not removed. A portion of large intestine and nearly half of pelvic cavity denuded of peritoneum. A long strip of 1 per cent. iodoform gauze was laid over this denuded surface from the culdesac up to and out through the abdominal opening for drainage during the first forty-eight hours, and to provide for the probable escape of feces later. We anticipated shock that usually comes on before the end of operations of this character, by starting the submammary injection of normal saline solution when patient was first placed upon the operating table. This was continued during the operation and two quarts were introduced in this manner. Patient left table in good condition, no shock following. One week after operation, fecal matter began escaping through drainage, this continued in large quantities for ten days then gradually subsided, and on Nov. 30, about five weeks after operation the tract was healed and the patient left the hospital.

May 18, 1908, patient returned very much improved in looks and 35 pounds heavier. Abdominal wound remains closed. Menstruating regularly, no pain. Oct. 19, 1908, returned complaining of pain in left lower quadrant of abdomen. Cessation of menses since July 21. Examination found uterus forward enlarged to a size corresponding to a three months' pregnancy. Confinement May 7, 1909, male child, weighing 12 pounds, Dr. Barricelli attending, and reporting labor began at 5 P. M. and ended at 11 P. M. Oct. 9, 1910, gave birth to second child, female weighing 10 pounds, Dr. Barricelli attending.

CASE XIV.—Mrs. B. S., age twenty-one, married fifteen months, one child, five months old. Complains of backache, headache and bearing-down distress. Pain in both iliac regions. Examination reveals uterus large and retroflexed, movable, both ovaries readily felt, swollen and tender.

*Operation, Dec. 16, 1907.*—Uterus cureted, abdomen opened, uterus brought forward, a cyst the size of a cherry excised from each ovary and wounds sutured. Several smaller ones punctured. Both ovarian ligaments shortened and a Gilliam operation per-



formed on round ligaments. Rapid convalescence. An easy case in comparison to the one just reported.

Oct. 1, 1909, reported pregnant and delivered later by Dr. J. M. Moore, normal confinement.

CASE XV.—Mrs. R. D., age thirty-one, three children. Came complaining of severe constant pain in left inguinal region, backache and headache. Operated three years ago in Glasgow, right tube and ovary removed, and suspension of uterus made. Had one child since operation. Confinement prolonged. Examination revealed a bilateral tear of cervix, uterus enlarged and retroverted. Left ovary prolapsed, enlarged and tender. Nothing felt in right vaginal vault.

*Operation, Feb. 8, 1908.*—Uterus curetted, cervix repaired, abdomen opened, appendix normal, stump of right tube found, not patulous, left ovary enlarged, sclerocystic, one-third resected. Gilliam operation on round ligaments. Recovery uneventful.

*Pathologist's Report.*—Interstitial endometritis, sclerocystic ovary.

Jan. 4, 1909. Patient reported her last menstruation was Nov. 28, 1908, believes she is pregnant. March 10, 1909, returns and reports she has felt fetal movements. Moved to Akron and was confined at the Akron City Hospital, Sept. 21, 1909, child healthy and nurses.

CASE XVI.—Mrs. C. M., age twenty-six, one child, two miscarriages. Came complaining of pain in back and lower abdomen, dragging sensation, headache. Trouble starts from child birth sixteen months ago. Examination reveals laceration of perineum, bilateral tear of cervix, uterus forward but low down, both ovaries prolapsed, enlarged, tender. Pain on pressure over McBurney's point.

*Operation, June 11, 1908.*—Uterus curetted, cervix repaired, perineorrhaphy, abdomen opened, appendix kinked, catarrhal, removed. Right ovary cystic, one-half resected, left ovary smaller but cystic, cysts punctured. Rapid convalescence. Left hospital July 3, 1908. Returned May 5, 1909, has been well. Last menstruation Feb. 6, 1909. Examination, uterus enlarged, softened, secretion in breasts. Undoubtedly pregnant. Confined November, 1909, normal labor. On Oct. 18, 1910, was brought into hospital after having a sudden onset of cutting pain on left side, lower abdomen, attended with faintness and partial collapse.

A diagnosis of ruptured ectopic pregnancy was made, operation performed, and left ruptured tube and ovary was removed, large dots of blood filling cavity. Right ovary examined and found in good condition. Recovery prompt.

CASE XVII.—Mrs. S. L., age twenty-four, two children, two miscarriages. Came complaining of pain in back and limbs and in lower abdomen, constipated, gradual loss of weight and strength. This condition developed after birth of last child.

Examination, partial rupture perineum. Bilateral laceration of cervix. Uterus enlarged, forward, mobility impaired.

*Operation, July 18, 1908.*—Uterus curetted, cervix repaired, abdomen opened. Both ovaries adherent to tubes, separated, tubes patulous. Left ovary cystic and a portion resected. Appendix enlarged and infected, removed.

*Pathologist's Reports.*—Chronic endometritis, chronic appendicitis, cystic ovary.

Twenty-four hours after operation patient developed a double pneumonia, was dangerously ill for ten days, but left hospital two months after operation.

Nov. 1, 1909. Patient returned and was found to be pregnant. Confined Jan. 1, 1910 and was delivered of an 8 pound baby girl by Dr. R. A. Bolt. Patient has developed evidences of a tubercular laryngitis with suspicious signs at right apex.

CASE XVIII.—Sept. 12, 1908. Mrs. M. K., age twenty-five, married eighteen months, one child at term, three weeks old. Complaints of pain over heart and in left lower abdomen, pain is sharp and intermittent, coming at intervals of one-half to two hours. Can feel tumor in lower abdomen. Physical examination of chest revealed that patient had a complicated heart lesion, consisting of aortic insufficiency with mitral stenosis and insufficiency. Double murmur at apex, diastolic thrill, systolic murmur at second right interspace, capillary and water hammer pulse, pistol shot femoral. Examination of pelvis and abdomen shows a tumor mass extending to umbilicus, movable, tender. Vaginal outlet torn, large bilateral tear of cervix, uterus enlarged and posterior to a large tumor mass in front.

*Operation, Sept. 14, 1908.*—The patient's precarious condition ruled out a prolonged operation. Morphine,  $1/4$  grain and atropine  $1/150$  grain were given hypodermically half hour before operation. When placed upon operating table the submammary injection of normal saline solution was begun. Ether, by drop method. Abdomen opened by a short incision in median line. A large, smooth-walled, fluctuating tumor was revealed, as large as a child's head, arising from the left side and twisted several times upon a long pedicle. Upon the introduction of a trochar, a thick, cream-colored, butterfat fluid material was extruded. Abdominal excision lengthened, tumor was delivered. Ligated pedicle and tumor removed. Three pints of saline was introduced during the operation. Pulse remained good throughout, there being no evidence of cardiac disturbance. Right tube and ovary found to be normal. Oct. 4, patient dismissed. Heart lesion same, compensation apparently accomplished.

*Pathological Report.*—Thin-walled dermoid cyst, size of fetal head, contains thick butterfat material and fine blonde hairs, no other embryonic tissue. No evidence of malignancy. Sac quite vascular, with a long fine pedicle containing vessels.

Patient returns Feb. 10, 1909, three months, pregnant.

Patient returns Aug. 5, 1909, eight months pregnant, feeling well. No report since as patient moved from her former home.

CASE XIX.—Mrs. C. R., age thirty, married thirteen years, one child twelve years old, four miscarriages, last one eighteen months ago, induced.

*Operation, Dec. 14, 1908.*—Left ovary and tube removed for cystic disease with adhesions. Cysts in right ovary punctured. Prolapsed right kidney. Gastropsis. Convalescence normal. Dismissed Jan. 8, 1909.

January 31, 1910. Patient came back and reported that she had given birth to a girl baby, Nov. 23, 1909. No abnormalities, good convalescence. For last three weeks patient has had bloody discharge with some odor. Examination revealed carcinoma of cervix, advised immediate radical operation, this was declined and she did not again return.

#### DISCUSSION.

DR. ALBERT GOLDSPOHN, Chicago.—The resection of ovaries is one of the best things that the gynecologists do, that is, in the operations that are not for saving life. It is something that has interested me ever since August Martin in Berlin brought out his first publication on the subject. After that, a gentleman in New York did the operation and published it. I was the next man who published anything on the subject west of New York. I have had many tussles, in these years, with men on that subject; who, on account of a defective technic or bad judgment, had poor results. These were mostly general surgeons. What may be saved and what must be removed? They did not know; and they did not succeed; and others failed because they did not use the right technic. Furthermore, I have had tussles with visionary theorists who, by making a series of sections of some of these enlarged cystic follicles, would occasionally, not often, find a Graafian follicle in such cysts; and therefore this morbid physiology must overthrow and paralyze everything the gynecologist can do. They have said, that is a normal ovary; you must not touch it if it is six times its normal size, and it does not matter how much pain it may cause the patient. It is better to do nothing for her. There are that kind of men in the world. They do not succeed in gynecology, however. They have to make a living out of general surgery.

So far as the technic is concerned, not long ago (I think it was last year), a man from New York State or New York City published an article in favor of resection of ovaries, but he commits a serious fault in technic by attempting to use almost any kind of suture material. That is radically wrong in my estimation. I have always contended that the surgery of the ovary requires not only the finest catgut but also a degree of asepsis such as we do not need for ordinary intraabdominal work.

We should do like the surgeon who is exceedingly cautious about asepsis in using plates in the treatment of fractures, and in the surgery of bones, and joints; that is, he does his work with sterile instruments and not with gloved fingers even. That is the kind of asepsis we want if we would achieve success.

Then comes the use of the finest and most readily absorbable suture material, so placed as not to cut off the nutrition of the ovary. Coaptation but not constriction. These are the things that are necessary in order to achieve success.

DR. FRANCIS REDER, St. Louis.—I was particularly interested in what Dr. Goldspohn had to say in regard to the technic of this interesting paper of Dr. Humiston.

So far as the resection of a portion of the ovary is concerned, it necessitates considerable experience to recognize the normal from the abnormal structures in a pathologic ovary. But as to the technic: it becomes absolutely necessary to excise enough of the ovarian tissue to obtain a good apposition of the capsule. For this reason it is sometimes well to sacrifice some of the healthy tissue of the ovary to secure this coaptation. It promotes the reparative process and prevents sequelæ, such as adhesions to the intestines.

With reference to the suture material, it is a fact that the finest suture should be used, such as No. 00 catgut, if you have sufficient confidence in it, if not, No. 1. In suturing the ovary a round needle, either straight or curved, should be used. The first row of sutures is placed at a good depth to control bleeding and to bring together the ovarian tissue. The next row of sutures simply coaptates the edges of the capsule. A continuous suture is the preferable one. It is not necessary to clamp the base of the ovary with a hemostat, by taking a piece of twisted gauze and throwing it about the base, clamping it so it is secure, is sufficient to shut off the circulation and prevent the field from becoming bloody. One might be led to believe that much pain follows the suturing of an ovary; there is, however, but very little pain.

The restoration of an ovary to its normal state is perhaps as grateful a surgical measure as there is in gynecology.

DR. K. ISADORE SANES, Pittsburg.—I should like to briefly report a case which demonstrates how much can be done in the line of conservative surgery on the ovary. A prostitute was admitted to the Gynecological Ward of the West Penn Hospital of Pittsburg for bilateral acute pyosalpinx. She gave a history of syphilis of about two years' standing and acute gonorrhea of one year. We kept her for about one month at the hospital until all the acute symptoms subsided, and then did a laparotomy on her. After separation of adhesions, the tube and ovary on one side were completely removed and on the other side the tube with the cornu and the greater part of the adherent cystic ovary were removed leaving a thin portion which was sutured over the raw surface as a sort of protective patch. About a year later she

came to the office pregnant. She was delivered at the West Penn Hospital of a child without any complications.

DR. HUGO O. PANTZER, Indianapolis.—The number of cases operated and followed by pregnancy that become known, does not indicate the full percentage actually occurring. The full estimate of the gain by conservative methods should, moreover, include the cases not traceable after operation, and also cases that could conceive, but where conception is countermet by preventive measures. The latter class is large, because the fear of a pregnancy and parturition is uncommonly heightened in the minds of those who have undergone operation for the relief of parturient injuries.

Regarding the surgery of the ovary, I have not found it particular nor less successful than the surgery of other tissues of the body. I found no harm to follow the sewing of the ovarian stroma, no need to include in the stitches only the capsule. The union established by sewing can be likened to the ligamentous union in bones, that is, in the sequence the scar stretches under intracapsular swelling. By this change the heretofore unyielding, thickened albuginea which obstructed advancement and follicular rupture—under the ligamentous scar the Graafian follicle now grows toward the area of the yielding scar, which is less resistant than the sclerotic albuginic wall. This is verified by the lessening or absence of pain at menstruation after operation.

In the cases of ovarian sclerosis, I pare the thickened albuginea over the entire surface of the ovary. In extreme cases, in addition, I divide the ovary into lateral halves, sew it again, and so aim to obtain more yielding tissues along the line of ligamentous union. I have no fears of adhesions by such procedures. Without the presence of an infectious process, permanent adhesions do not form. In the presence of an infectious process, of course, no plastic surgery upon the ovary, as elsewhere, should be attempted.

DR. HUMISTON (closing the discussion).—The time in which to report cases of this kind is so short that one is not permitted to take up in detail the technic in these cases. After opening the abdomen, I can lift the ovaries up and inspect them. If I find they are suitable for resecting, I grasp the ovary with my left thumb and finger to control the hemorrhage. The unhealthy part I then proceed to resect. I take a sharp knife, take out the portion that is cystic and diseased with a clean cut, and then approximate the edges carefully. I use a round needle with No. 1 catgut and find it satisfactory. I take a great deal of pains in coaptating the line of incision nicely to avoid oozing of blood. If you introduce sepsis it is a different matter, but I think nowadays we have sterilization perfected, and with an operation performed with rubber gloves, the matter of asepsis is readily secured.

I am only sorry that I could not trace out all of these cases

because it would have made a much better report, but in quite a large clinic made up of transitory people it is impossible to find them all and secure a correct report. I spent three weeks with an average time of ten hours a day on seventy of the cases I have followed to give you this report.

I believe that in the suppurative cases, where the virulency has subsided, and you have pus remaining in one ovary, and the other ovary is good, you can safely take out the diseased ovary and leave the other without any danger of recurrence, unless there is a renewed infection or trouble following of an acute specific nature.

*(To be continued.)*

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## TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

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*Meeting of October 8, 1912.*

*The President, GEO. G. WARD, M. D., in the Chair.*

### STRANGULATED FIBROID UTERUS.

DR. WILLIAM E. STUDDIFORD.—The patient from whom the uterus was removed was fifty-two years of age. Her menopause occurred at the age of forty-two years. She was single and a native of Ireland. She was admitted to the service of Dr. Henry C. Coe at Bellevue Hospital on June 3, and died on the same day. The diagnosis made was strangulated fibroma of the uterus.

Her father and mother died at the age of sixty and sixty-five respectively; in each case the cause of death was unknown. She had one brother and one sister alive and both are well. She denied any venereal history. Her menstruation began at the age of seventeen and had always been regular. She had never been pregnant. She does not remember having had any of the diseases of childhood and had never been injured. She was operated upon for a ventral hernia twenty-four years ago and was in the hospital three weeks, making a good recovery.

She had been complaining for the last three years because of a weight in her abdomen. This was not accompanied by pain. However, on the night of June 1, 1912, the patient felt a stinging pain in the lower part of her pelvis; it was very sharp and continuous. The bowels moved and the patient vomited the next day. The next night her abdomen became distended and she complained of severe pain all over her abdomen. The next morning she went to the hospital.

She was admitted at 11.30 A. M. with a temperature of 104.8° F.; pulse 140 and intermittent; respirations 60. She was somewhat cyanotic. There was a dry, brownish coating on the tongue and she had an anxious expression. The physical examination re-



vealed a ventral hernia which had followed an operation two years ago for a strangulated umbilical hernia. The hernia protruded, was tympanitic, but not especially tender. A hard tumor was felt in both flanks and she was extremely tender in the lower abdomen. There was moderate distention. The vaginal examination showed an abdominal tumor which was connected with the uterus. The patient was given a combination enema with good results. Since admission she had not vomited, but she was growing progressively weaker, was operated on and died on the operating table at 5.10 P. M. The abdomen was filled with a turbid, yellowish fluid which was sterile. The tumor was strangulated by a complete twist around the lower uterine segment.

#### DISCUSSION.

DR. H. N. VINEBERG said that the specimen presented by Dr. Studdiford was another illustration that large multiple fibroids might suddenly give rise to disturbances after a long period of quiescence. He reported a case of this kind to the Obstetrical Society in the spring. He was called into consultation and a diagnosis of multiple fibroids was made and there was present a twisting of the pedicle in one of the subperitoneal growths. The woman was dreadfully ill and had a temperature of 104° F., a pulse of 140, and the abdomen was very much distended. He operated at once and the patient made a good recovery. She had passed the menopause and had been carrying these fibroids for years with the only discomfort occasional attacks of abdominal pain.

#### INCONTINENCE OF URINE DUE TO LACERATION OF THE SPHINCTER OF THE BLADDER, CURED BY OPERATION.

DR. SAMUEL M. BRICKNER made this report. The patient was a woman, twenty-five years old, admitted to the first gynecological division of Mt. Sinai Hospital (Dr. Brettauer's service), July 18, 1912. The family and previous history were negative. Menstruation began at the age of twelve; there was no pain. Her last period occurred two weeks ago. She had been married two years and had had one child eight months before, who died during an instrumental delivery. She had a severe laceration which was partly repaired at the time of labor. Three weeks later a second operation was done for the repair of the torn urethra.

Since child-birth she has complained of constant dribbling of urine and especially when in the erect position. On physical examination there was found slight excoriation of the labia. The perineum was in good condition. The cervix was slightly lacerated, the uterus retroverted and small. The appendages were normal. The promontory could not be felt. The anterior vaginal wall was deformed, the anterior segment below the urethra being edematous and bulging and lay beyond the left side of the urethra. No fistula was present, the urethra was entire,

and there was a prolapse of the urethral mucous membrane over the entire circumference; it was evident that the urethra with the anterior vaginal wall had been torn for a distance of 1.5 centimeters and 1.4 centimeters from the left side.

On July 22, he repaired the torn bladder sphincter and the lacerated urethra. Most of the right side of the urethra was found torn off and had sagged downward with the prolapse of the mucosa. The finger could be introduced into the bladder. A median incision was made into the anterior vaginal wall as for the Wertheim operation for cystocele. The bladder was freed and an intact urethra was found only 2 centimeters in length. A number of mattress sutures (chromic gut No. 1) were passed around the base of the bladder. These finally brought into view the retracted edges of the torn sphincter muscle which were then sutured together with chromic gut No. 1. The urethra was then repaired by creating raw surfaces and the appropriate edges were brought into contact. The operation was finished in the typical Wertheim fashion. A permanent soft catheter was introduced, which was removed on July 27. The inferior portion of the urethral walls failed to unite with the flap to which it was originally attached. On July 29, the urethral orifice was healed on the right side and the urethra was found to be intact. There was sphincteric action as the catheter was gripped at the entrance to the bladder. The patient regained complete control of her urine. On August 1, the bladder contained 8 ounces of urine. There was no leakage on coughing, pressure or sneezing. There was perfect control present. A secondary operation was required because of a defect in the urethra and this was done under local anesthesia. The small area of urethra which had failed to unite was repaired by a plastic operation. The patient was discharged cured on August 17, with perfect bladder control and now could retain her urine from four to five hours.

#### DISCUSSION.

DR. GEORGE W. JARMAN called attention to those cases in which operation was done for injury following the operation of trachelorrhaphy, the cases that were so well described by Dudley of Chicago. The work done by Dudley was not exactly as the work done and described by Dr. Brickner. He asked Dr. Brickner regarding the injection of paraffin around the urethra and, if used, what were his results.

DR. CHARLES G. CHILD, JR., thought that Dr. Brickner's case was a good illustration of what could be accomplished by plastic work on the urethra in those cases of incontinence of urine due to destruction of the sphincter of the bladder. He reported a very interesting case from his service at the City Hospital. This patient was admitted complaining of much pain at the base of the bladder and difficulty of urination. The history obtained showed that the night before her entrance to the hospital there had occurred a rupture of an abscess at the

base of the bladder; the following day there was incontinence and the bladder was found to contain no urine. Pus was discharging from the urethra. There was as well a discharge about the vestibule; the anterior urethra was intact, but the posterior urethral wall for two inches was destroyed. The opening into the bladder was so large as to permit the introduction of the index-finger. Dr. Child believed the case to be one of a gumma which had broken down. The Wassermann test, however, was negative. The opening became cicatrized. The patient remained in the hospital ward and now, ten days later, had perfect control over the flow of urine. There was to-day from 6 to 8 ounces of urine held in her bladder. He was unable to account for such a great destruction of tissue in this instance, except by the presence of a gumma.

Another case at the City Hospital he said he would report more in detail at some subsequent meeting. This woman gave a positive Wassermann test. There was great destruction of tissues about the vestibule and base of the bladder. The condition complained of had existed for a number of years, probably four or five. One could readily introduce four fingers into the bladder. The defect was repaired by inserting purse-string sutures over a catheter which was left *in situ* for ten days and, at the time of her discharge from the hospital six months later, she had perfect control over her urine. A bladder test showed that she could retain as much as 18 ounces of urine.

DR. HOWARD C. TAYLOR said that in cases of complete incontinence of urine due to laceration of the sphincter of the bladder, the question of operation was not as difficult to decide, as in those cases where the incontinence of urine was not complete but only present at times of special stress—as coughing, sneezing, laughing, etc. As in the former case the conditions could not be made worse by an operation, while in the latter class of cases, a condition which is only an inconvenience could be made almost unbearable. Many of the cases of partial incontinence of urine were due to a dragging on the sphincter of the bladder, rather than to a definite laceration of its fibers.

Dr. Taylor reported a case of incontinence of urine in a woman who had no laceration of the cervix or perineum, and no appreciable displacement of the uterus. The patient had had no confinement for over twenty years. This case of almost complete incontinence of urine was entirely cured by the insertion of an ordinary retroversion pessary. The explanation of the case probably is, that as the woman advanced in years the ligament of the uterus became weakened and allowed a little prolapse of the uterus, not enough to be detected by the examination, but sufficient to drag on the sphincter of the bladder, and the support of this uterus with the pessary was enough to take off this dragging, and in that way cure the case. A number of times the pessary was left out for a time to see if the patient would not be all right without it, but on every occasion there was an immediate

return of the incontinence. This case subsequently came to an operation for subacute appendicitis, and it seemed wise as the abdomen was open to remove the appendix, to suspend the uterus with the idea that this would hold up the uterus and in that way to dispense with the pessary. This support of the uterus by operation was sufficient to keep the weight and dragging from the sphincter of the bladder, and the patient remained well without the pessary.

DR. J. RIDDLE GOFFE was very much interested in the report made by Dr. Brickner and wished to report a similar case of a woman who had reached the menopause and who had borne several children; she had a small cystocele and a leaking bladder. Because of a prolapse of the uterus, as well as the cystocele, there resulted incontinence of urine. Dr. Goffe did his own operation for the cystocele and he also did what he could, without actually seeing it, toward catching the sphincter muscle of the bladder. This work was done two and one-half years ago. He saw the patient the first of last June and she reported perfect control over her urine and was very comfortable. He attributed the success largely to the elevation of the base of the bladder as accomplished by his cystocele operation.

The second case Dr. Goffe reported was that of a colored woman who had lost entire control of her urine since her confinement. The urethra had entirely sloughed away leaving a little nodule of tissue at the neck of the bladder with an opening which readily permitted the finger to enter. The question arose how to restore this defect. An effort was made to make a passage above the subpubic ligament and to line it with a strip of mucous membrane taken from the interior of the bladder, but the stitches tore out and the strip retracted into the bladder. A second attempt met with the same result. Then a wide denudation and dissection was made at the neck of the bladder and stitches passed to diminish the caliber of the exit. This proved successful in giving partial control. Plastic procedures later at two successive sittings built up a urethra and gradual recovery of satisfactory control. She became pregnant and at the third month of her pregnancy consulted Dr. Goffe. She had an extremely contracted pelvis and the question arose as to whether to permit her to go to term and then to be cared for by a Cesarean section. To this she consented. During the summer, however, she miscarried.

DR. HENRY DAWSON FURNISS said that while Dr. Brickner was to be congratulated upon the result that he had had in the repair of this lesion, he felt that the condition was more readily remedied than the more usual so-called relaxed urethra that followed child-birth. In the examination of this second class, with the patients in the knee-breast posture, and using a Kelly speculum, it was seen that the urethra did not close over the end of the speculum as it was withdrawn from the bladder into the urethra as it usually does, but that it remained

more or less open. This lack of tone could also be appreciated when injecting the urethra from the external orifice by the lack of resistance to the introduction of fluids. The same condition is sometimes observed in nulliparous women near the time of the menopause.

The most successful operation has been that of Gersuny, which consists in freeing the urethra and giving it a twist of from 90 to 180 degrees or more. One must be careful after making the twist to anchor the vesical portion in its new position, and not make the mistake of so anchoring only the proximal portion. Casper has recently advocated the production of a contracting scar by cauterizing the sphincter with the electric cautery.

DR. EDWIN B. CRAGIN reported in brief a case of incontinence of urine following a symphysiotomy which he had treated successfully by twisting the urethra and referred to the fact that many cases of partial incontinence were greatly benefited by the passage of the cystoscope, or a good sized sound. This was evidenced by the return of patients at intervals asking to have the sound passed because of the relief experienced from the procedure.

DR. SAMUEL M. BRICKNER closed the discussion. He said that when his patient was under the influence of the anesthetic, his finger readily slipped into the bladder through the laceration and he thought that repair could be made in similar cases by a proper dissection. Mattress sutures were used about the base of the bladder and the patient now had perfect control.

The etiology in these cases was as interesting as was the pathology. During a normal labor the urethra was gradually extended; toward the end of the labor it was pushed down by the descending head of the fetus. The sphincter muscle in many of these cases was torn through and resulting symptoms persisted for months afterward, with the occurrence of a little cystocele, sometimes without any cystocele.

#### RENAL HEMATURIA, DECAPSULATION, NEPHRECTOMY.

DR. HENRY D. FURNISS reported this case. The patient was fifty years of age and her previous history was negative. She was first seen in the early part of December, 1911, when she reported that for three months the urine had been as dark as port wine, from the admixture of blood. There was no pain and no frequency of urination. A radiographic examination for stone was negative. The blood pressure was 125 mm. and amount of urine 450 c.c. a day. The patient had lost only slightly in weight. Examination of the bladder was negative. Just proximal and to the inner side of the normal ureteral opening was seen a slight depression that looked like the orifice of another ureter. This could not be catheterized, nor was colored urine seen coming from it after the injection of indigo-carmin. After the injection of 20 c.c. of 0.4 per cent. indigo-carmin into the gluteal muscles elimination began from both sides in



fourteen minutes. Cystoscopy showed bright red blood coming from the right ureter at each spurt; that from the left was clear. The urine from the left side showed a slight amount of albumin and an injection of adrenalin into the renal pelvis had no effect on the hematuria. There were a few hyaline and finely granular casts.

February 10, the right kidney was cut down upon and the capsule of the normal sized kidney was about four times as thick as normal and very adherent, the kidney being torn in the decapsulation that was performed. There was no cessation of the hematuria after the operation, so the patient was given 1 1/2 ounces of human blood serum every other day for two weeks without effect. Calcium lactate was tried unsuccessfully. After the decapsulation the amount of urine rose to 1500 c.c. in a day.

On March 12, indigo-carmin R. was administered and colored urine came from the left ureter in twelve minutes. As the hemorrhage did not cease at the end of six weeks a nephrectomy was done by Dr. George Gray Ward. It was found that there were two ureters and a double renal pelvis.

Examination of the kidney by Dr. Hillman showed some edema and round-celled infiltration of the cortex which was probably due to the former decapsulation. There was free blood in the straight and convoluted tubules, which showed that the source of the hemorrhage was from the kidney substance.

The patient made an uninterrupted recovery, and had since been well. Two weeks after operation the amount of urine rose to 1200 c.c., and was free of albumin and casts.

#### RENAL HEMATURIA, CESSATION AFTER URETERAL CATHETERIZATION.

DR. HENRY D. FURNISS reported this case. The patient, Mrs. P., was fifty years of age. The previous history was negative except that three years ago she had had hematuria for three days, which seemed to be worse after exertion. There was no return until March of this year, since which time the urine had been continuously of a port-wine color. Exertion or rest had no effect upon this. There was some dull aching pain in both lumbar regions, but no loss of weight or strength.

Cystoscopy showed a normal bladder. Both ureters were catheterized, and bloody urine was obtained from the left. Examination of the urine from the right ureter was negative both microscopically and chemically. Two days after the cystoscopy the urine was free of blood and had since remained so. In a letter received from the patient's husband on October 8, he stated that she was feeling better than in the past few years, and that the lumbar pain, with the hematuria, had disappeared.

Hagner of Washington had reported a case of cessation of hematuria after ureteral catheterization, and suggested that possibly a small ureteral polyp had accounted for the hemorrhage



and that the relief followed scraping it away in passing the catheter. It hardly seemed that such was the case in this instance as the ureteral catheter continued to drain bloody urine. Had it scraped off and passed the attachment of the polyp, clear urine should have been obtained. It was possible that it could have scraped away a polyp just at the point to which it was passed in the ureter.

#### RENAL HEMATURIA, CESSATION AFTER DECAPSULATION.

DR. HENRY D. FURNISS reported this case. The patient, Mrs. L., fifty years of age, was seen for the first time on September 4, 1911. The previous history was negative. She reported that for two months the urine had been bloody, of port-wine color. There was no pain or frequency of urination. Cystoscopy showed a normal bladder with urine red in color coming from the right ureter. The urine obtained from the left ureter showed a trace of albumin and an occasional hyaline and finely granular cast. Radiography for stone was negative.

On September 14, the right kidney was cut down upon; it appeared perfectly normal. Decapsulation was performed and in two days the urine was free from blood.

On October 4, an estimation of the renal function with phenol-sulphonaphthalein was made which showed 50 per cent. in the first hour and 23 per cent. in the second.

This case was referred from the service of Dr. Arthur Chase and to him Dr. Furniss said he was indebted for the previous history and that after the operation.

#### URETERAL CALCULUS, IMPACTED AT VESICAL ORIFICE, RELEASED BY FULGURATION CAUTERIZATION.

DR. HENRY D. FURNISS reported this case, which had been referred to him by Dr. E. W. Peterson. The patient was forty-nine years of age and reported that eleven years ago she had an attack of pain in the right lumbar region lasting three days, which was followed by hematuria and the passage of gravel. She was free from pain and all bladder disturbance until three months ago when she had pain in the right lumbar region that lasted for an hour. Since that time she had had hematuria almost constantly; there was enough blood in the urine for the patient to recognize it. She had had urgent and frequent urination.

Examination showed that the urine was turbid and dark pink in color from blood. Cystoscopy showed what looked like a papilloma with a broad base just over the area of the right ureter and anterior to this. There was some edema around it. Thinking it a papilloma, it was fulgurated on July 14, and again four days later. At an examination three days later there was seen a dark stone just showing through the tumor-like mass. An attempt was made to liberate this with the patient in the knee-chest position using a Kelly tube and a small curet. The patient was un-

able to keep still, so the attempt was abandoned. Four days later the patient was again examined and the stone was almost born; it was as large as the tip of the adult male ring finger. She was advised to come into the hospital and allow the removal of this through the bladder. They had planned to dislocate the stone, using a large Kelly tube, pass a wire snare around it, and remove it through the cystoscope. If it had been too large for this, they would have crushed it with a lithotribe, and washed it out with an evacuator.

This woman was very fat, and the radiograph which was not especially good failed to show the stone. Dr. Furniss believed that any growth or tumefaction at the vesical orifice of the ureter, especially if there was an edematous condition, should make one suspicious of stone. These patients should be radiographed before any attempt was made to fulgurate a supposed papilloma. In the fulguration they had a bloodless method of releasing impacted stone, as the fulgurated tissue would in a few days slough away.

#### DISCUSSION.

DR. GEORGE GRAY WARD, JR., discussing the first case of renal hematuria, decapsulation and nephrectomy, said he was astonished to learn, upon opening the kidney, how little reason there was present for such bleeding. The mucous membrane of the kidney pelvis was pale with several petechial spots, but it was hard to realize that so much bleeding could take place when there was no erosion. In this case the urine was very dark, of a port wine color. At Dr. Ward's suggestion injections of adrenalin into the kidney pelvis were tried but without any good results.

DR. GEORGE W. JARMAN believed that all of such cases should be examined for the malarial parasite and when treated properly, the hematuria would often clear up.

DR. BROOKS WELLS reported a case of

#### ECTOPIC PREGNANCY IN ONE TUBE OF A DOUBLE UTERUS. RIGHT SUPRAVAGINAL HYSTERECTOMY. RECOVERY.

A. E., aged thirty-one, married four years, had borne one child shortly after marriage. Labor was normal. She had one abortion from natural causes at the third month about one year ago. Menstruation began when she was thirteen, was always normal in type and without pain. She menstruated from December 3 to 10 and again on January 1, since which time she has "spotted off and on." On coming to the clinic at the Polyclinic she complained that for five weeks she had suffered with increasing constipation, abdominal distention and some pain. For two days she had suffered with severe pain in the right side extending from ribs to pelvis and with tenderness over the region of appendix made worse by sitting. Temperature normal.

Abdomen was moderately distended by a smooth, rounded mass

extending half way from the pubes to the umbilicus and most prominent on the right side. The diagnosis made by the gentlemen at the clinic was uterine fibroids with inflammation of the right appendages. I came into the operating-room late, just as the patient was ready for operation and, as her appearance was not good, to save time omitted a vaginal examination, contenting myself with an abdominal palpation and so missed my opportunity for a correct diagnosis. Later she was found to have two cervixes.

The abdomen was opened by a transverse incision and the omentum freed from a smooth, firm, bluish tumor filling the pelvis and extending nearly to the umbilicus. There was no free blood in the peritoneal cavity. The mass was firmly adherent and was broken during enucleation, discharging a firm mass of old clots. It was evidently a right tube and ovary attached to a normal-sized uterus, but the left appendages were missing. Further search showed a second uterus of good size pushed to the left and with left appendages. Each uterus was well developed and of approximately normal size. Between the two uteri was a deep sulcus fully an inch broad occupied by a firm ligament-like band extending between bladder and rectum. The right uterus and tubal mass was removed by supravaginal hysterectomy. Oozing from a large surface of bladder which had been adherent over the mass was controlled by pressure with gauze wrung out of boiling water. Many bleeding points over the bed from which the mass was enucleated required ligation. Stump and bed were covered as far as possible with peritoneum. Appendix adherent to mass and in acute inflammation was removed. Patient made a very smooth and quick recovery.

DR. WELLS also reported a case of

#### PAPILLARY CARCINOMA OF THE OVARY.

Mrs. H., aged fifty-six, mother of two children, passed the menopause between forty-nine and fifty. No pelvic symptoms since until present trouble. Three years ago was operated upon by a skilled surgeon for acute appendicitis, from which she made a slow recovery, drainage being employed for several weeks. He found no evidence at this time of any pelvic trouble.

In July last she had a slight fall, hurting her back and right hip, and since then has had some backache and soreness, for which she was treated by her physician for gravel. September 14, she began to have severe pain over the lower abdomen and right hip and extending down the anterior crural and sciatic. She had noticed a loss of weight and strength since July and looked thin and old. Appetite very poor. Increasing constipation since July. I saw her on September 18 and found a firm, cystic, immovable, rounded mass filling the pelvis and extending up into the abdomen on the right side, the uterus being pushed to the left. Otherwise physical examination showed nothing abnormal. A diagnosis was made of adherent ovarian cyst probably malignant. She was sent into hospital and operated on the

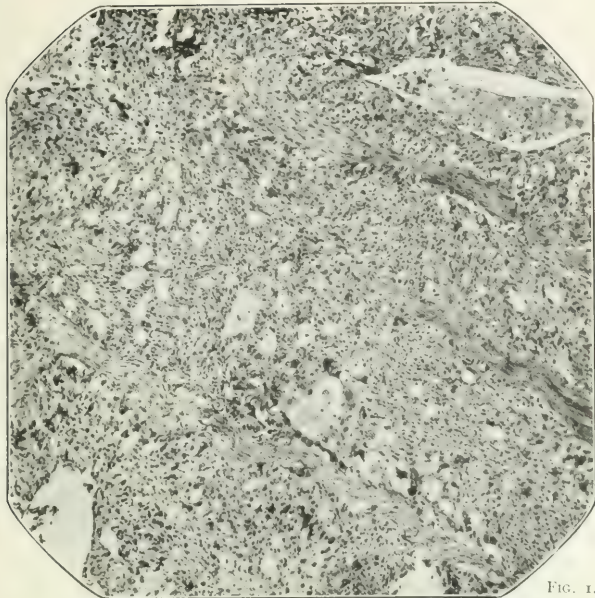


FIG. 1.

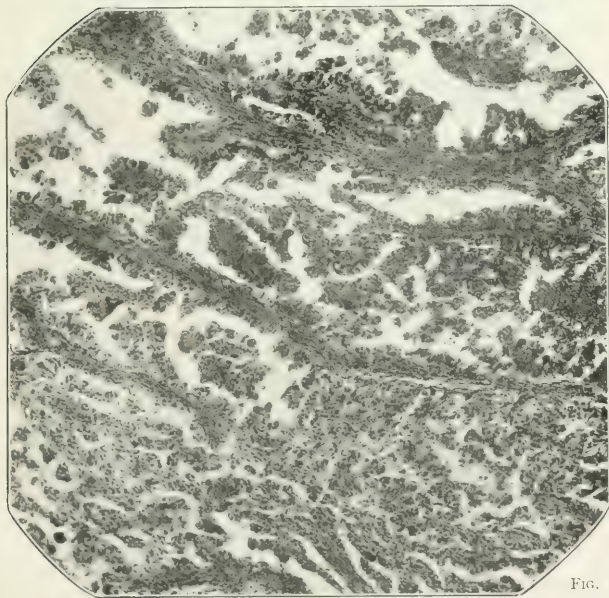


FIG. 2.

PAPILLARY CARCINOMA OF THE OVARY.—WELLS.



next day. Median incision. Pseudointraligamentous cystic tumor of the ovary enucleated with some difficulty and removed. No adhesions about region of appendix. Patient's vitality seemed much depressed and she made a slow recovery. Her temperature on admission was  $101^{\circ}$  and it remained at  $101^{\circ}$  for forty-eight hours after operation and then became normal and remained normal. On the twelfth day the wound which had been thought perfectly healed began to break down and opened up its full length down to the fascia discharging a few drops of a yellow, serous, sterile fluid. There are now (December 20) evidences of recurrence of the trouble manifested by continued failure in strength and severe pain referred to the pelvic region underlying the site of the tumor.

The tumor, about the size of a small grapefruit, was a cyst of the ovary filled with a brain-like mass of semi-necrotic material, macroscopically very characteristic of mixed celled sarcoma.

A section from a portion of the tumor not necrotic showed masses of undifferentiated cells (embryonal type) which vary much in shape, size, and configuration, and between which can be seen intercellular connective tissue (Fig. 1). This section seemed to present points of unusual interest and was submitted to a number of prominent pathologists with the following results:

One held that it was a mixed celled sarcoma of the type of embryonal sarcomas as distinct from fibrosarcoma. This class has also been called alveolar sarcoma from the fact that the masses of cells are somewhat separated by broader connective-tissue septa. He found great variability of the cells, intercellular substance, and giant cells.

The second said it was not sarcoma, but that the cells were characteristic of an epithelial tumor, a carcinoma.

The third took the position that it was a teratoma, saying that a year or two ago it would have passed as an alveolar sarcoma, but that now from analogy with testicular tumors of a similar character it must be classed as a teratoma.

The slide was then sent to a pathologist in Vienna who inclined to the opinion that it was an endothelioma.

They all agreed on one point, that it was an embryonal tumor of rapid growth and great malignancy.

The apparent rarity of the tumor and these divergent opinions from men of the highest rank in the world of pathology led to the most careful examination of tissue from many portions of the growth which finally revealed a minute area of unaffected ovarian tissue, and the advancing border of the neoplasm which was invading this gave the unmistakable picture of an ordinary papillary adenocarcinoma of the ovary (Fig. 2). The older portions of the tumor, where the cells had become undifferentiated, gave little on which to base a diagnosis.

The divergent diagnoses made in this case are reported not to discredit in any way the knowledge of any of the pathologists concerned but to emphasize the urgent necessity of the examina-



tion of sections from as many regions of a tumor as possible in order that our knowledge and prognosis may be complete and reliable. This applies even in cases where the diagnosis of the tissue structure seems clear.

#### DISCUSSION.

DR. EDWIN B. CRAGIN spoke of several instances of double uterus in his own experience which had presented interesting problems:

One of these, occurring at the Roosevelt Hospital many years ago was supposed to be a case of salpingitis, but, on the removal of the mass from the side of the uterus, it was found to be a hematometra of the undeveloped half of a double uterus. He was assisted in this operation by Dr. Jarman.

The next case of double uterus presented itself in the latter part of pregnancy with the placenta in one horn of a uterus bicornis and the child in the other. Another case was one of uterus didelphys in which one uterus was pregnant and the pelvic canal was obstructed by the other. During the labor the two uteri split off from each other, causing a rupture of the parturient canal.

Still another case was that of a double uterus and vagina, with a communication between the two vaginae just below the cervices. One uterus was pregnant, and in the labor the fetus which presented by the breech came down with one foot and a loop of cord in one vagina and the other foot in the other vagina. A rapid division of the septum alone saved the child's life.

The most recent case of double uterus observed by him was one seen with Dr. Dorman and was that of a uterus bicornis. The patient was pregnant and during her pregnancy suffered severely from the irregular contractions of the divided fundus.

#### CASE OF CARCINOMA OF THE UTERUS IN A GIRL EIGHTEEN YEARS OLD.

DR. EDWIN B. CRAGIN reported this case. The patient was only eighteen years of age and was seen in consultation with Dr. H. Seymour Houghton on April 26, 1912. For several months she had been suffering from menorrhagia which had responded in part to rest, the administration of ergot and other measures. When she was examined by Dr. Houghton he was very much surprised to find a large cauliflower growth which extended from the cervix. This growth was removed by Dr. Houghton and sent to Dr. Frederic E. Sondern for examination and he pronounced it to be a carcinoma. Slides of the growth were later examined by Prof. Francis E. Wood, Director of the Crocker Cancer Research Laboratory and he concurred in Dr. Sondern's diagnosis.

On May 4, 1912, a radical abdominal hysterectomy (Wertheim operation) was performed by Dr. Cragin at the Sloane Hospital for Women. The patient made an excellent recovery

and when seen on September 16, 1912, showed no evidence of any recurrence of the disease.

This case was reported as being the youngest instance of carcinoma of the uterus ever seen by the writer.

#### DISCUSSION.

DR. FRANK A. DORMAN asked if any enlarged pelvic glands were present.

DR. CRAGIN replied in the negative.

DR. BROOKS M. WELLS had seen one case of carcinoma of the cervix occurring in a woman at the age of eighteen years. This patient had been recently married, had gone over her time for menstruation a few days, and then flowed profusely. An early abortion was suspected and a curettage done. Microscopical examination of the scrapings showed adenocarcinoma. A radical vaginal hysterectomy was done. Histological examination of the specimen showed a very early carcinoma at the level of the internal os and that the hysterectomy had removed all of the disease. This patient was well when last seen four years after the operation.

#### TWO CASES OF RETRODISPLACEMENT.

DR. FRANK R. OASTLER said he wished to report two cases of retrodisplacement that had happened in his practice during the last eight months. Both these women, aged twenty-seven and twenty-nine respectively, applied at the hospital because of retroverted uteri and they were operated upon. In both the Gilliam operation was performed, one by himself. In both instances a secondary operation was required four and six months after the operation because of a hernia at the site of attachment of the round ligament to the abdominal wall. These cases were reported to show that disagreeable complications might result following the Gilliam operation for retrodisplacement.

#### DISCUSSION.

DR. BROOKS H. WELLS asked if the Gilliam operation was done or one of its modifications.

DR. OASTLER replied it was the Gilliam operation.

DR. GEORGE W. JARMAN said that he had done many Gilliam operations and had yet to see bad results following them and he had performed it just three times to-day. He had seen some cases with a very complete procidentia. One case in particular had a complete procidentia and was operated upon. He had never seen any bad results following the modified Gilliam operation.

DR. HIRAM N. VINEBERG was not at all surprised to hear Dr. Oastler report such an occurrence after the Gilliam operation. He was surprised that it did not occur oftener than so far has been reported. The thrusting of a dull instrument through the fascia and peritoneum, dragging through the opening thus made

a loop of the round ligament and suturing the loop to the fascia did not appeal to him as a surgical procedure.

DR. FRANK R. OASTLER said that the symptoms complained of were (1) pain at the point of attachment of the round ligament to the abdominal wall; (2) the presence of a lump which would appear from time to time. Upon cutting down upon this mass a reducible omental hernia was found to the inner side of the attachment of the round ligament to the fascia in one case and a portion of a knuckle of intestine in the other. It would seem that in order to obviate the defect it would be advisable to scarify the round ligament where it passed through the abdominal wall and also to pass a purse-string suture of catgut through the peritoneum where the round ligament passed through, thus insuring proper attachment of peritoneum to peritoneum.

DR. CHARLES G. CHILD, JR., said that the treatment of the round ligaments in operations for retrodisplacements was very important, and that their nutrition should be interfered with as little as possible. He had had to reoperate upon a number of cases in which the Gilliam operation had been done previously and had found that there had been entirely too much traumatism of the ligaments, resulting in extensive atrophy. In two cases in which the Gilliam operation had been performed there was intestinal obstruction, one of the cecum and one of the small gut, due to incarceration of the peritoneal pouches anterior to the broad ligaments.

DR. RAWLS.—“In line with Dr. Oastler's cases I wish to call attention to faulty technic as a source of failure in the Gilliam operation. On Dr. Brown's service at the Woman's Hospital, we had the opportunity of operating on a case of adhesions following a Gilliam operation. The omentum had become attached between the parietal peritoneum and the ligament and at the lower part of the incision the peritoneum and muscles had retracted and the omentum was firmly attached to the fascia. In another case, with a history of some round ligament operation, I found the omentum protruding through an opening in the peritoneum and firmly attached to the muscles and fascia. These cases illustrate the necessity of selecting a point in the round ligament which will leave no unnecessary slack in that portion from the internal ring to its new attachment and second that the puncture through the peritoneum, muscle, and fascia shall be far enough away from our incision so that the peritoneum may be easily closed without any tension.”

## TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

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*Meeting of October 3, 1912.*

*The President, GEORGE M. BOYD, M. D., in the Chair.*

DR. STEPHEN E. TRACY read a short paper on

"FISTULA IN ANO." \*

### DISCUSSION.

DR. HENRY D. BEYEA.—This operation may have advantages over the ordinary method. Could not the same result be accomplished by excising the fistulous portion of the sphincter? Incision of the sphincter does no great harm. In my experience the usual operation is not followed by any severe pain. The dressings are not painful. I have not seen a large number of these cases as they are most apt to occur in men.

DR. COLLIN FOULKROD reported a case of

### CESAREAN SECTION FOR DERMOID CYST COMPLICATING LABOR.

Mrs. C., a young primipara, was sent to the Presbyterian Maternity, September 7, 1912, for some complication preventing delivery.

Had been in labor thirty-six hours; hard labor, twelve hours; membranes ruptured; head not engaged; pelvic measurements normal.

Patient had not felt motion in the child for two hours before entering the hospital; heart sounds not heard. The examining finger found the pelvis filled with a mass partly cystic, partly doughy, impacted in front of the child's head, and of sufficient size to prevent descent. The mass seemed extrauterine, but it was difficult to determine if retroperitoneal. Cervix one-half dilatation, but head not engaged. The temperature was normal. No history of previous pelvic trouble.

Thinking it might be feces, the rectum was cleared out, and a rectal examination outlined a mass impacted in the pelvis undoubtedly extrauterine, but outside of bowel.

Dr. Nicholson saw the case with me, and after setting aside pelvic inflammatory disease because of the splendid health of the patient, the lack of temperature, and the lack of previous symptoms, a dermoid cyst was suspected.

Undoubtedly, the child had been dead for some hours. The membranes ruptured some time before entering the hospital.

\*For original article see page 33.

The patient had been examined by an outside physician. These factors all constituted some contraindication to section.

We, therefore, examined carefully under ether by the vagina to determine the feasibility of vaginal delivery. This was found impossible, even by means of an embryotomy. The abdomen was opened and the dead child extracted in the usual manner. After sewing up the uterus, the pelvis was explored and a dermoid cyst, the size of a small fetal head found impacted in the pelvis. This originated from the left ovary, an elongated pedicle allowing for its position in the pelvis. The cyst was removed. The abdomen was closed. The uterus was drained with iodoform gauze placed in position before closing the hysterotomy wound, and afterward tied to another piece introduced into the vagina after thoroughly swabbing the vagina out with bichloride solution.

This gauze was removed at the end of twenty-four hours. The patient was kept in a modified Fowler's position to encourage drainage. The patient has made a perfect recovery.

The cyst contained hair, caseous material and a few hard particles. The pedicle was turned, but not twisted.

DR. HARRY A. DUNCAN reported two cases:

CASE I. *Urinary and Fecal Fistula*.—Mrs. C. H., age twenty-eight years, married eight years, mother of three children, no miscarriages, presented herself on May 26, 1909. She complained of bearing-down pains in the lower abdomen, vaginal discharge, backache, headache, and burning urination. These symptoms were of two years duration. The menses lasted three weeks out of each month.

Examination revealed a large mass in the right inguinal region extending a slight distance above McBurney's point. This mass was hard, immovable, and apparently adherent to the anterior abdominal wall. On the left side the tube and ovary were enlarged and adherent. A right inguinal hernia was also discovered.

On June 7 an incision was made in the median line. The condition seemed to be a pelvic abscess involving the appendix and head of the cecum. The appendix, right tube and ovary, and the left ovary could not be found. The left tube full of pus was removed, the large abscess cavity cleansed and drainage, both abdominal and vaginal, introduced.

The patient made a good recovery and left the hospital at the end of the third week. At this time the abdominal wound was still discharging a small amount of pus. After two or three months small amounts of fecal matter made their appearance through this fistula, particularly when the bowels were loose. This state of affairs persisted for two years then urine discharged from the same opening. During the day the escape of urine was almost nil if the bladder did not become too full but during the night the escape of urine was constant.

A cystoscopic examination revealed a large opening in the fundus of the bladder through which I was able to pass a ureteral

catheter until it presented at the skin surface. Because of the progressiveness of this pathologic lesion I feared either tuberculosis or a malignant change. The cystoscope did not reveal any evidence of either.

The patient was returned to the hospital. An incision was made to the left of the fistulous opening through the anterior abdominal wall into the peritoneal cavity. The descending colon communicated with the fistula by a lateral opening which was easily closed after its true position was determined. The fistulous tract, including the edges of the bladder, was excised. The bladder opening was closed with chromic catgut and an effort made in closing the peritoneum to bring the closed opening in the bladder extraperitoneal. Because of the marked tension on the fascia a few silkworm-gut sutures were employed. A small drain was introduced at the lower end of the incision extending down to the opening in the bladder, and the skin sutured with catgut. A self-retaining catheter was introduced into the bladder and the patient returned to bed.

After three days no leakage had occurred and the drain was removed. After five days the catheter had caused the patient so much discomfort that it was ordered removed and the nurse told to catheterize the patient every two hours. On the eighth day the silkworm-gut was removed. A few drops of urine escaped from the lower stitch hole and by the next day there was quite a little extravasation of urine beneath the skin and constant drainage from the stitch hole. The self-retaining catheter was again introduced and maintained in position for two weeks. At the end of the fourth week the patient left the hospital and for four months has been well.

CASE II. *Infection by Fränkel's Pneumococcus after Criminal Abortion.*—Mrs. M. L., age thirty-six, was seen with Dr. Bate-man, June 6, 1912. The patient stated that she had missed one or two periods and one week previous had introduced a stiff rubber catheter into the cervix uteri. Nothing had come away and there was no bleeding. A few hours before she had suffered a severe chill. Her temperature was 101 and pulse 112.

Examination revealed a purulent discharge from the vagina and soft boggy uterus enlarged to the size of a two months' pregnancy. The finger could detect a placenta-like mass through the cervix.

She was removed to the Garrettson Hospital and the uterus emptied by the finger and placental forceps, of the whole product of conception in a much macerated state. The microscopic examination of this tissue showed it to be infected with the pneumococcus. The temperature went to 103° F., pulse to 110, and the patient looked very ill; there was some delirium, pale pinched facies and vomiting.

Continuous proctolysis and stimulants were employed. On the third day the patient complained of severe abdominal pain and all of the signs of local peritonitis extending as high as the



umbilicus were present. There was no evidence of pelvic abscess or pyosalpinx, the uterus remained freely movable. A white blood count gave 70,000 leucocytosis; 4,000,000 pneumococcic bacteria produced no change in the patient's condition.

In about ten days the peritoneal infection localized and a firm mass could be outlined just below the umbilicus and to the right of the median line.

The mass gradually grew smaller and the patient was able to return to her home on the twenty-fourth day.

#### DISCUSSION.

Dr. BROOKE M. ANSPACH.—One case of this kind gave me a great deal of worry. It was that of a woman past sixty, with sarcoma of one ovary. In removing the growth, the ureter was exposed for quite a distance. The bleeding was hard to stop. I put in drainage. At the end of two weeks, there was a urinary fistula. This was dressed for a long time, and not until four months had passed, did it close. It closed then, I think, because of contraction of the ureter and atrophy of the kidney. During this time she had several attacks of severe pain on the affected side.

In another case which I saw in consultation, an operation had been done for fibroid tumor. Here there was first fistula through the lower end of the abdominal incision and later through the cervix. The discharge from the cervix continued for months. The bladder urine kept perfectly clear, though there were attacks of pain on the diseased side. It was possible to pass a urethral catheter through the cervix right up into the kidney. A catheter passed into the ureteral opening of the same side, met with obstruction at a distance of 2 centimeters. A diagnosis of hydronephrosis was made, and the kidney removed. The patient made a good recovery. This is often what you must do when there is a persistent fistulous opening in the ureter, especially if there has been much loss of tissue.

Dr. HENRY D. BEYEA.—I should like to ask Dr. Duncan what examination was made of the tissues removed in that case and whether they proved to be tubercular and what was the character of the disease causing perforation into the bladder.

Some years ago Dr. Penrose did an oophorectomy at the University Hospital. The urine came from the bladder and the wound sloughed. The patient had a hard time for a number of weeks. She finally went home. She later came back with a fistula discharging urine. Operation was done closing the fistula and she got perfectly well. In this case I understand the urinary fistula developed some time after the primary operation and seemed to be due to the extension of the disease, as if there were a tuberculous process which had gone on and caused it.

Dr. STEPHEN E. TRACY.—I was much interested in the report of Dr. Duncan's case and wish to congratulate him on the ultimate result. I have had no experience with urinary fistula

through the abdominal incision. I have had one case of uretero-vaginal fistula, following a Wertheim operation for carcinoma of the cervix uteri. The patient was operated upon over three years ago, and there has been periodical leakage, at intervals of three or four weeks, since the sinus closed temporarily a few weeks after operation. The patient has persistently refused to be relieved by operation.

DR. DUNCAN (closing).—Answering Dr. Beyea's question, upon careful examination we could find nothing suggestive of either tuberculosis or malignancy. The microscopic examination of the excised tissue revealed only inflammatory changes. The condition of the patient now would seem to bear that out, that the affection was simply inflammatory. Even while the fecal fistula was present the patient continued to gain in weight and general health. She had been in a depleted condition before the first operation. Feces were not discharged through the fistula until after she had left the hospital for some two months. Two years later the urinary fistula developed.

DR. FRANK C. HAMMOND reported a case of

#### OVARIAN CYST SIMULATING ACUTE APPENDICITIS.

"The differential diagnosis between right-sided tubal, ovarian, or tuboovarian disease and appendicitis is of the greatest practical importance. Errors in both directions are frequent. Owing to the constantly increasing importance of appendicitis in recent years, the diagnosis of this condition is unquestionably made too often. The source of error is due, of course, to the proximity of the structures in question, and particularly in the fact that the two processes are interdependent and often associated. The symptoms of the two conditions also may be very similar.

The case in question presented all the signs and symptoms of an acute appendicitis, but a bimanual examination revealed a pelvic involvement.

The case in point is J. B., thirty-four years of age, married, seen in consultation with Dr. R. D. Snively May 4, 1912. Twelve hours previously she was taken with sudden sharp pain in the lower right quadrant of the abdomen, later followed by nausea and vomiting. When asked where the pain was located she placed her finger directly on McBurney's point. The pain increasing in severity, and no one symptom having shown improvement, Dr. Snively suspecting an acute appendicitis, requiring operative interference, very kindly asked me to see her. There was marked tenderness on pressure over the lower right quadrant of the abdomen, most intense at McBurney's point, rigidity of the musculature on the right side was present, but absent on the left side. Pressure over the left side of the abdomen did not influence the distress on the right side. Up to this part of the physical examination, the patient presented typical signs and symptoms of acute appendicitis. Making the usual routine bimanual examination, as should be done in all these cases,

a globular fluctuating mass was found upon the right side, which was suspected to be an ovarian cyst. Operation was advised and accepted. On account of the pelvic involvement, a median incision was made. Upon opening the abdomen, an ovarian cyst about the size of a small lemon was found on the right side, with torsion of the pedicle, there being four and a half twists. The cyst sac was just beginning to show a purplish discoloration. The pedicle was untwisted, ligated with plain catgut, and cyst removed. The appendix was not involved, but was removed. The patient made an uninterrupted recovery, and left the hospital on the fourteenth day.

#### DISCUSSION.

DR. STEPHEN E. TRACY.—I think we will all agree with Dr. Hammond on the importance of a differential diagnosis between appendicitis and lesions in the right side of the pelvis, and will agree with him further that mistakes in diagnosis do occur, but this applies more especially to the general surgeon who diagnoses nearly all lesions in the right lower quadrant of the abdomen, appendicitis. On a number of occasions I have heard the general surgeon remark when about to operate, that the patient had a diseased appendix, but if she had gone to a gynecologist he would have been looking for the trouble in the pelvis. Several times when these remarks have been made, the surgeon after having removed an innocent appendix, reached into the pelvis and pulled up large pus tubes, which were evidently the cause of the symptoms. I know one woman who has a scar beginning well out in the right iliac fossa and extending obliquely to the symphysis pubes, through which a hysterectomy was done. A few weeks after she had been discharged from the hospital I saw the patient in consultation, because of bleeding from the vagina. Upon examination a fibroid was found in the vagina, which was attached by a small pedicle in the cervical canal, yet the surgeon had made a diagnosis of appendicitis, and had cut accordingly. It was evident that he had made no pelvic examination at any time. I have had several cases of appendicitis associated with gestation: one case of acute appendicitis complicated by a ruptured ectopic gestation; one case of acute appendicitis associated with a left ovarian cyst, with a twisted pedicle and acute peritonitis.

DR. COLLIN FOULKROD.—I remember two interesting cases somewhat similar to those reported. One was a case of dermoid tumor. I have had two or three in the last year. This was a right-sided dermoid. The patient had had a diagnosis of appendicitis made before she came under my care. With this attack the pain was excessive. It was so severe that I thought possibly there was extrauterine pregnancy. Upon operation I removed a dermoid cyst of the right side and a bad appendix. The patient got perfectly well. Another time there was sent into the Presbyterian Hospital an apparently very bad case of local

peritonitis, associated with a three to four months' pregnancy and a temperature  $100^{\circ}$  with excessive pain. Upon opening the abdomen I found a fibroid the size of the four months' pregnant womb, incarcerated in the pelvis. The fibroid womb was allowed to remain, the patient went to term. The operation by replacing womb out of pelvis cured pain and temperature.

DR. GEORGE M. BOYD.—I operated upon a case yesterday which impressed upon me the importance of examining the pelvis carefully after the patient is fully anesthetized. The case was brought to the hospital with the diagnosis of appendicitis. The pain was chiefly around the region of the appendix, though more over the whole lower abdomen. There was a history of fever for days. The attending physician had only superficially examined internally. Examination under full etherization revealed a mass on the back of the uterus and to the left side. The careful examination of the patient's vagina just prior to operation fixed the point of incision as central rather than lateral. It occurred to me that possibly the general surgeon, or the man not trained in the routine pelvic examination, might have made his incision over McBurney's point, lifted out an inflamed and ill appendix, and that the chief lesion, a pus tube of very fair size with pelvic abscess and leakage with peritonitis might have escaped detection, for there was enough in the appendix to explain the fever and pain.

## TRANSACTIONS OF THE SOCIETY OF THE ALUMNI OF THE SLOANE HOSPITAL FOR WOMEN.

*Regular Meeting, held October 25, 1912.*

*The President, DR. FREDERIC O. VIRGIN, in the Chair.*

### REMOVAL OF AN OBSTETRICAL BOUGIE FROM THE ABDOMINAL CAVITY.\*

DR. JOHN DOUGLAS reported this case.

#### DISCUSSION.

DR. HENRY P. DE FOREST, in discussing this case, referred to an extraordinary instance of a foreign body which had been introduced by a woman in an effort to produce abortion, and was described by the late Dr. T. Gaillard Thomas, at one time Professor of Gynecology in the College of Physicians and Surgeons. The history of the case was as follows: A physician and his wife called on Dr. Thomas and stated to him that at a previous confinement the woman had nearly lost her life as the re-

\* For original article, see page 25.

sult of some complication. She had become so apprehensive of a repetition of this condition that she had definitely resolved never again to allow a pregnancy to continue. She passed a menstrual period, believing herself to be pregnant, and three days before, while her husband was away from home, went to the barn, procured a wire from an old umbrella, sharpened the end of it with a file, and lying down in bed, had introduced this wire into the vagina and into the uterus. She continued slowly to push the wire upward in spite of the pain until finally the entire length of the wire had disappeared into the vagina. Then as she described it, "it was suddenly seized from above, and snatched out of her hand." A vaginal examination was made, but failed to reveal any evidence of the missing wire.

Abdominal surgery was then in its infancy, and few men in the country were qualified for this class of work. The husband, upon hearing his wife's story, had taken the next train for New York to have Dr. Thomas himself perform an abdominal section, and remove the foreign body.

Dr. Thomas questioned the woman, and she confirmed this extraordinary statement in all particulars. The operating-room was prepared for an immediate operation, the nurses were in readiness, and the anesthetist was about to administer ether, when the husband of the patient interrupted Dr. Thomas in his preparations by saying, "Doctor, I do not myself believe that this story can possibly be true. I found no evidence myself to substantiate my wife's tale, and if, as a result of this operation, my wife should die, I will hold you personally responsible." Inasmuch as Dr. Thomas was performing this purely as a personal service for a brother physician, he did not feel like assuming legal responsibilities as well as the responsibility of the operation itself. Stepping to the side of the operating-table he said, "Madam, will you swear that the story you have told me is true?" "No, Doctor," she said, "I will not." "Then, gentlemen," said Dr. Thomas, turning to his assistants, "there will be no operation." The woman sat up on the operating-table, gave a gasp, and fell back dead.

When the excitement had subsided, Dr. Thomas stated to the husband, who by this time had changed his mind as to the credibility of his wife's story, "Now, sir, this woman has died in my hospital under suspicious circumstances. Either you give me permission to perform an autopsy, or the coronor will be called to do it." Permission was granted. The body was examined and the truth of the woman's story verified in practically every particular.

The full length of the umbrella wire, thirteen inches long, had passed through the posterior culdesac, had perforated the mesentery in several places, had passed through the liver, and through the diaphragm close to the median line into the right pleural cavity. When the diaphragm was perforated, a muscular spasm had occurred, the diaphragm had sharply contracted,

and had quickly drawn the wire from the grasp of the unfortunate woman. The sharp point of the wire was close to the great vessels at the root of the right lung, erosion had taken place, and when the woman sat up on the operating-table, the wall of the right pulmonary artery had given way and death was practically instantaneous. There was no evidence whatever that pregnancy had existed.

This extraordinary story, told in a most vivid and characteristic way by one of the most brilliant lecturers in medicine which this country has ever produced, made such a permanent impression upon the speaker's mind that a year ago in lecturing upon the subject of abortion at the Post-Graduate Medical College, he related the incident in substance as above detailed. At its conclusion, one of the physicians in the audience rose, and stated that the story was absolutely correct for he himself was an interne in Dr. Thomas' private hospital and was the anesthesiologist referred to.

The case is such an extraordinary one and so intimately associated with our former teacher, and with our present duties, that it seemed an appropriate time to incorporate it in the records of this Society.

DR. GEORGE L. BRODHEAD presented an abdominal binder which was made by one of his nurses and used by him in private work with the greatest success. It was made of strong canvas and could be adjusted to the patient's abdomen by a series of straps and buckles. The binder could be readily washed and laundered after removing the buckles. It was easily adjusted and very comfortable for the patient.

The paper of the evening was entitled;

"PROGRESS OF THE YEAR IN OBSTETRICS."\*

DR. GEORGE L. BRODHEAD read this paper.

#### DISCUSSION.

DR. SAMUEL L. BRICKNER said the Dr. Brodhead's modesty evidently kept him from referring to his own recent important paper on "Induction of Labor," in which he had reported 139 cases where the dilating bags were used, and stated that in 85 per cent. it was necessary to use two bags only. The induction of labor in all cases should be established upon a substantial and scientific basis, and Dr. Brodhead's paper had certainly contributed to this end.

Dr. Brickner in referring to the use of pituitrin, stated that he had had eleven cases in which this preparation had acted in a most favorable manner, the results being very gratifying under the circumstances indicated by these particular cases, but he believed it useless in the induction of abortion and that it acted only after the labor pains had been inaugurated.

\*For original article, see page 12.



DR. F. R. OASTLER said that there was one subject of especial interest to him in connection to the matter under discussion, namely, the use of bacterins in septic processes following labor or abortion. For the past six or seven years he had been studying the results following the administration of bacterins and could testify to the good results which attended their use. It was of course a well-known fact that many cases of puerperal sepsis of a severe nature, if left to themselves, would recover, but as many uniformly good results were obtained in grave conditions with the use of bacterins, the benefit to be derived from them could hardly be questioned. The violence of the disease did not seem to depend upon the infection as much as upon the virulence of the strain. The best field for the application of the bacterins was found in the subacute and chronic cases.

DR. HOWARD C. TAYLOR said that during a recent trip abroad he had seen a number of cases of Cesarean section done by the extraperitoneal method, but that this did not always imply that the peritoneal cavity was not opened. As performed by some operators the parietal peritoneum was sutured to the uterus itself. After the general peritoneal cavity was thus shut off, the uterus was opened and the child extracted. In other clinics the peritoneum was stripped from the bladder and pushed up to the uterus, the bladder being displaced downward and the child extracted without opening the peritoneal cavity at all.

DR. G. H. RYDER said that he was especially interested in Dr. Brickner's remarks on the use of pituitary extract in uterine inertia. In the past four months he had used this preparation in about ten cases, and the results as already stated were simply magical. In a very recent case the pains had stopped entirely late in the first stage. One cubic centimeter of pituitary extract was given by hypodermic and in seven minutes strong expulsive pains came on followed in one-half hour from the time the drug was given, by the natural birth of the child. In all the other cases except one, the results were equally remarkable. In the instance which proved the exception, there was found an obstruction due to an occiput-posterior position. In this case the pains were little influenced by the drug which was given only once. The posterior position was then corrected under anesthesia and delivery completed by forceps. Dr. Ryder considered that pituitary extract was of use only in uterine inertia without obstruction, and one which afforded a certain means of combating this trying condition, for in many cases the necessity for the forceps was thus entirely obviated.

DR. W. H. W. KNIPE said that he could not understand why pubiotomy should give such good results in multiparæ and such poor results with primiparæ, for, providing the indications for the operation were similar and the skill in the performance equal in both multiparæ and primiparæ, the only difference between the two classes to be considered the elasticity of the vaginal soft

parts and the perineum; and pubiotomy in primiparæ is no more contraindicated on this account than is the forceps operation.

Statistics which are dependent upon many varying factors should not be too greatly relied upon; for the bad results seen in primiparæ may have been due to pelvic deformity or to bad judgment in selecting the operation in the particular case and in which the primiparity may have been only an incidental condition.

To show how easily an extraneous accidental condition may mar statistics, he referred to a patient upon whom he performed pubiotomy during the past summer, who left the hospital three weeks after operation walking without difficulty, but who returned one month later complaining of pain in the hip and limping badly—surely not a good result from a pubiotomy, had the statistics been made at this time. However, he took pains to follow this case and upon his visit a few days later, his patient was walking without pain—at this time a good result from a pubiotomy. The “change” in the statistics was due to a little liniment and a few words of cheer.

There is really very little antagonism between Cesarean section and pubiotomy; the former operation is the one of choice in many obstetrical difficulties, whereas pubiotomy has a limited field of usefulness in conditions where there is only a slight disproportion between the head and the pelvis and especially in funnel-shaped pelves. In the latter condition when an operation becomes necessary, pubiotomy is the ideal one whether the patient be a multipara or a primipara.

DR. BRODHEAD in closing the discussion referred again to the extraperitoneal Cesarean section which he understood was conducted through an incision made above the pubis with the bladder partly filled. The peritoneum was pushed back from the uterus and in this way the incision in the latter could be made outside of the peritoneal cavity. Regarding the use of pituitrin in abortion cases, Dr. Brodhead referred to a patient seen at the Gouverneur Hospital who was four months pregnant, bleeding moderately, with cervical dilatation of one finger, but no pain whatever. This examination was made at 10 A. M. and at 8 P. M. a dose of 1 c.c. of pituitrin was given, no pains having been present in the meanwhile. They started in immediately, however, and the patient delivered herself successfully several hours later.

The second paper of the evening was entitled:

#### THE DIAGNOSIS OF EXTRAUTERINE PREGNANCY.\*

DR. SAMUEL M. BRICKNER read this paper.

#### DISCUSSION.

DR. F. R. OASTLER stated that Dr. Brickner's paper was of especial interest to him because he had recently been studying the history of some sixty odd cases of ectopic pregnancy operated

\* For original article see p. 27.

upon by himself and his associates, most of them during the past twelve months. He agreed with Dr. Brickner that a diagnosis of ectopic gestation was far from easy. However, he found that it was considerably less difficult to diagnose the second twenty-five cases in his series than the first twenty-five, and this was due to a more careful consideration of the symptoms of seemingly little import, that enabled the specialist to diagnose a condition in which the general practitioner who had seen but few cases, would fail. For instance Dr. Brickner had mentioned the presence of a slight rise of temperature in ectopic gestation in fifty-six cases studied. Dr. Oastler had also found a rise of temperature between  $95.5^{\circ}$  and  $100.5^{\circ}$  F. in most of his patients. High temperature, on the other hand, was very uncommon. The examination of the blood was of value, although the speaker stated that he had found a normal leukocytosis in most cases and likewise normal polymorphonuclear percentages, but had frequently found a diminution in the red cell count and also in the hemoglobin. As to the etiology of ectopic gestation, it seemed certain that in many cases no previous diseased condition of tubes and ovaries could be found either clinically or pathologically. There was one point in the differential diagnosis between septic conditions and ectopic gestation which had not been mentioned and which seemed to him to be of value. He referred to the position of the uterus, which in a large majority of the cases of pyosalpinx or of tuboovarian diseases was in retroposition, whereas in ectopic gestation the uterus was in the normal position or thrown forward, for in the latter class of cases adhesions of sufficient strength to pull the uterus backward had not had time to form. In referring to the difficulty of diagnosis, Dr. Oastler detailed the history of a case with apparently well-marked symptoms of ectopic pregnancy which on operation was found to be an ovarian cyst associated with normal pregnancy. In another case supposed to be about four months pregnant, with pain and bleeding, a diagnosis of ovarian cyst was made, which on operation was found to be a four months' abdominal pregnancy. In the series of cases already referred to by the speaker, traces of albumin and cysts were often found in the urine.

DR. HOWARD C. TAYLOR said that there were two ideas regarding ectopic gestation which he thought were not strictly correct. The first was that most cases of ectopic gestation did not require an immediate operation, and the second was, that most cases were easily diagnosed. Very frequently cases that were diagnosed as ectopic gestation were found at the time of operation not to be of this nature, and cases diagnosed otherwise were found at operation to be ectopic pregnancies. Dr. Taylor believes that the blood count was usually a factor of some value in the recognition of ectopic gestation. With any acute hemorrhage a very definite change in the white blood count resulted, including a very high total count and a high polynuclear percent-

age, the number of white cells and the polynuclear cells being dependent upon the amount and rapidity of the hemorrhage. After the latter had ceased, both the total count and the polynuclear count diminished so that in a day or so much more moderate figures were obtained. In one case which occurred in the service of Dr. G. E. Brewer at the Roosevelt Hospital, there were present about 96 per cent. polynuclear cells and a total white cell count of about 45,000—a condition rarely ever met with except in the presence of an acute hemorrhage. Dr. Taylor also found that ectopic pregnancy was not infrequently diagnosed as acute appendicitis. A sudden and severe onset of abdominal pain and the prostration of the patient, were symptoms common to each. It must not be assumed that ectopic pregnancy, even in the cases where considerable hemorrhage occurred, was necessarily associated with a high pulse rate, as he had seen a case of ruptured ectopic with a pulse of less than 100 a few hours before the patient died.

DR. F. O. VIRGIN said that the multiplicity of signs and symptoms often clouded rather than added a clear opinion of ectopic pregnancy. He wished to call attention to certain distinguishing features which he had often noted in examining such cases. On vaginal examination, for example, a sensation was imparted to the finger tips which differ from the boggiess of pyosalpinx masses and which could be described as "mossy." Dr. Virgin believed that this was due to the fact that the mass was made up of blood clot and placenta and not of inflammatory exudate and pus. Referring to the comment that operation in cases of ectopic pregnancy may be delayed for some days with impunity, he recalled the fact that in a number of instances in the St. Luke's Clinic which were delayed for one reason or another, before entering the hospital, no serious results occurred. However, in view of the liability to certain rupture and profuse hemorrhage, he believed that these cases should be placed under such surroundings that an operation could be performed with the least delay.

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## REVIEWS.

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**THE PRACTICE OF OBSTETRICS.** Designed for the use of Students and Practitioners of Medicine. By J. CLIFTON EDGAR, Professor of Obstetrics and Clinical Midwifery in the Cornell Medical College; Visiting Obstetrician to Bellevue Hospital, New York City; Surgeon to the Manhattan Maternity and Dispensary; Consulting Obstetrician to the New York Maternity and Jewish Maternity Hospitals. Fourth Edition, revised. 1062 pages. With 1316 illustrations, including 5 colored plates and 36 figures printed in colors. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street, 1913, Cloth, \$6.00.

This book contains a marvelous amount of well-digested

information and is and will be in years to come an enduring monument to the tireless energy, the erudition, and the great clinical experience of its author.

The present edition bears evidence of a thorough and critical revision. The pathology of the various subjects has been largely rewritten and new material added on blood pressure; anesthesia in labor; vaccine and serum treatment in sepsis; hemorrhage of the newly born; pelvimetry of the pelvic outlet; funnel pelves and their treatment; premature rupture of the membranes; pubiotomy; extraperitoneal Cesarean section; the Momberg belt constriction for hemorrhage; and Posture in Obstetrics.

Especial attention should be called to the chapters on pelvimetry of the pelvic outlet and on the treatment of funnel pelves. These give a more exhaustive exposition of the subject than has yet appeared in any text-book. To Rudolph Klein, of Munich, belongs the credit of directing the attention of the profession to the importance of this subject. There is some very good new matter in the chapter on Posture in Obstetrics, especially in the effect upon the outlet of the exaggerated lithotomy posture and upon the inlet of the Walcher. The cautions in relation to the dangers and abuse of the Momberg construction are also timely.

Several illustrations have been redrawn and fifty-one new ones have been added to the text. With all this there are some ten pages less than before, though each page is some three lines longer.

What we said five years ago of the third edition can be said with added emphasis of this: Each edition approaches more closely the ideal of perfection. It is a veritable mine of information, a most valuable reference book, safe, reliable, encyclopedic and of the highest excellence.

**OBSTETRICS, A TEXT-BOOK FOR THE USE OF STUDENTS AND PRACTITIONERS.** By J. WHITRIDGE WILLIAMS, Professor of Obstetrics, Johns Hopkins University; Obstetrician-in-chief to the Johns Hopkins Hospital; Gynecologist to the Union Protestant Infirmary, Baltimore, Md. Third Enlarged and Revised Edition, with 16 plates and 668 illustrations in the text. New York and London: D. Appleton and Company, 1912.

The third edition of Professor Williams' book may be accepted as the final word in American text-books on obstetrics. The entire work has been thoroughly revised and additions and changes made in the chapters upon the development of the ovum, pubiotomy, Cesarean section, pernicious vomiting of pregnancy, the frequency of contracted pelves and the labor complicated by the latter. The favorable comments which were called forth by the first edition of this book may be repeated for the present one and attention merely called to some of the changes already noted. The Cesarean operation in its various aspects is fully discussed, the vaginal form, however, being included in the



chapter on accouchement forcé. As regards the question of sterilizing the patient in doing a Cesarean section, Williams considers that this can best be effected by supravaginal amputation of the uterus or by removing the ovaries. He does not believe that it should form a part of every Cesarean operation if no organic contraindication on the part of the patient is present. The author prefers an abdominal incision two-thirds below and one-third above the uterus, and then advises the latter to be delivered through the abdominal opening and not cut into until the edges of the latter have been clamped posterior to the cervix and covered with a sterilized towel, so that all possibility of infection in the abdominal cavity may be avoided. He also prefers the longitudinal uterine incision to a transverse one through the fundus. In view of the good results obtained by those operators who do not deliver the uterus through the abdominal incision, the advisability of Williams' recommendations may be questioned, as this manipulation undoubtedly adds to the shock of the patient and exposes a greater amount of peritoneal surface to injury. Williams' well-known attitude toward pubiotomy finds expression in the favorable opinion stated in his book. Up to January, 1912, he had performed thirty-eight successful pubiotomies upon thirty-six patients, in all of whom the Döderlein procedure was employed. He still advises encircling the pelvis with an adhesive band and keeps the patient in a Bradford frame for fourteen days. She is allowed to leave the hospital before the end of the fourth week if no complications have occurred. Williams finds that in his series of cases fibrous union was present more frequently than bony union. The operation is contraindicated when the true conjugate measures 7 centimeters or less and the author does not believe that it enters into competition with Cesarean section except for the broadened indication, but thinks that we may look forward to pubiotomy to displace the Cesarean section in the border-line cases when several hours of labor have demonstrated that the head cannot pass the superior strait. However, if one can be certain either from the size of the child or the history of previous labors, that interference will be necessary, the patient should not be subjected to the test of labor, and the abdominal Cesarean section done at an appointed time before its onset. Williams also holds that pubiotomy will still further restrict the field for the induction of premature labor and do away with the high forceps operation in contracted pelvis when the mother is in good condition. He does not believe that the operation should be undertaken when signs of infection are present, as the interests of the mother will be better served by Cesarean section followed by the removal of the uterus. This attitude may be accepted as a very conservative one, more conservative perhaps than that held by the author hitherto. Although the operation is still in abeyance and comes into close competition with the extraperitoneal Cesarean section which has recently been revived, it will nevertheless occupy in the



future a much more important position than has hitherto been accorded to it. A very complete description of contracted pelvis is presented, in which extended reference is made to the funnel type. In his own series of cases he found this deformity in 6.1 per cent., as compared with 18.33 per cent. of the usual types of deformed pelvis. Pelvic measurement is discussed in detail commensurate with its great importance. In referring to the chapters on anomalies of the pelvis, particular attention must be accorded to the illustrations, which are made according to scale so that the different varieties may be accurately compared. This portion of the book is of exceeding value and worthy of close study. The section devoted to the important subject of puerperal infection presents the matter in its most modern aspects. The toxemias of pregnancy are fully discussed in accordance with the author's well-known attitude on this subject. Williams claims as the result of his own investigations that the various disturbances of pregnancy which are generally described under this heading cannot be grouped together, and that essential and characteristic differences exist between the various conditions. In making this statement the fact should be borne in mind that differences in pathology may be accompanied by similar clinical manifestations. He denies that a proper classification can be based on the occurrence of such symptoms as fever, convulsions, albuminuria, or coma, but that we must depend upon our ability to demonstrate distinctive pathological lesions or to isolate certain specific poisonous principles. The former seems to be out of the question, but the latter, according to Williams has already been accomplished along certain lines. He therefore considers separately, groups of toxemias of pregnancy, as follows: (a) pernicious vomiting, (b) nephritic toxemia, (c) preeclamptic toxemia, (d) eclampsia, (e) presumable toxemia. In the treatment of eclampsia the author considers that prophylaxis is most important, but that in the presence of convulsions the best results are obtained if delivery is effected as soon after the first convulsion as is consistent with the safety of the patient. Williams favors this early delivery in preference to the conservative treatment advocated by Stroganoff, as he considers that the claims for the latter thus far advocated have not been sufficiently convincing. It would seem, however, as if this opinion were guided by personal preferences rather than by the results obtained by others. Professor Williams' excellent work is fully deserving of all the success which it has met with thus far and will unquestionably meet in the future.

GUIDE TO MIDWIFERY. BY DAVID BERRY HART, M. D.,  
Lecturer on Midwifery, School of the Royal College, Edinburgh; etc. With 4 illustrations in color and 268 diagrams.  
New York; Rebman Co.

Dr. Hart's book contains several features which are of interest. In the first part a succinct account of midwifery from a modern standpoint has been given. To each chapter, neces-

sary instructions are added, as to what practical work should be done and what specimens should be examined in order that the student may know the thing itself as far as possible and not its mere imperfect concept verbally expressed. This part contains all the necessary facts of obstetrics presented in a clear and satisfactory manner, with frequent reference to the specific work of the investigators whose names are known in connection with the various detailed facts presented. In the chapter on "development," the author departs from the use of the words to which we are accustomed, and refers to zyotes, gametes, oocytes, spermocytes, etc. A similar departure from accepted terms is to be found throughout the book and it is necessary in the reading to accustom one's self to the same. In the chapters on the toxemias or intoxications of pregnancy, the author discusses eclampsia quite fully, but does not pay sufficient attention to the other varieties of these conditions. In the concluding and smaller portion of the book, notes and discussions which are explanatory of the facts of the chapters in part one, are appended. Summaries of new operations and of views and theories which would distract the reader in the first study of the subject are likewise introduced. A chapter on "Evolution in Obstetrics" has been included, and the importance of Darwinism, Weismannism, and Mendelism in its practical relations is discussed for the purpose of awakening a more general interest in the subject by the profession. Dr. Hart may be commended for the manner in which he has written this portion of his book as it adds very much to its value without detracting from the teaching functions of the same. An examination of the contents will show the inclusion of many subjects which are ordinarily not discussed in obstetrical text-books, but which are too extended to be reviewed here in detail. The author emphasizes the importance of the study of the concrete object in obstetrics and not of a verbal description, but likewise to resort to the actual demonstration of the specimen or the operation whenever this is possible. This is also a reason why the book is not furnished with an abundance of illustrations, but merely a sufficient number to elucidate the text. The work is different from most obstetrical text-books, and being tinged with the author's personality, will undoubtedly meet with more attention than if he had followed the usual style of mere compilation.

A CLINICAL MANUAL OF THE MALFORMATIONS AND CONGENITAL DISEASES OF THE FETUS. BY PROFESSOR DR. R. BIRNBAUM, Chief Physician to the University Clinic for Women at Göttingen. Translated and annotated by G. BLACKER, M. D., B. S., F. R. C. P., F. R. C. S., Obstetric Physician to University College Hospital and the Great Northern Central Hospital; Teacher of Practical Midwifery at University College Hospital Medical School, etc. With 58 illustrations in the text and 8 plates. Philadelphia, P. Blakiston's Son & Co., 1912.

Until the appearance of the present work there has been

nothing published which has dealt completely with the whole subject under consideration. A debt of gratitude must be extended to both the author and translator for placing before the medical profession a work in which they have collected and made use of the valuable material in the general literature on the subject of fetal malformation. Being a gynecologist, Birnbaum naturally extended to the obstetrical side of the question, the most importance and the greatest detail, and in addition, the anatomical and pathological aspects are most capably and sufficiently discussed. The treatment of malformations is wisely left to the text-books on surgery. Congenital diseases and anomalies of the fetal membranes and placenta have also been omitted in order not to make the book too large. The illustrations for the most part are from original photographs taken from specimens in the collection of the Woman's clinic in Göttingen. The translator must be commended for his part in this undertaking, as the English version which he presents, while closely following the German text, still is flavored with originality and is not a literal or verbatim translation of the German work. He has also added a considerable number of notes to the original work, which are partly explanatory and partly contain certain additional information. The book presents in a fairly compact form an excellent résumé of our present knowledge on the subject, and to those who may be interested in obtaining further information, a fairly complete compend of the literature is appended to each chapter. The obstetrical importance of the various monstrosities and the legal rights of the same are fully discussed in two very interesting chapters which, with the index, complete this valuable book which is deserving of the careful attention of the medical profession.

**PATHOLOGY AND TREATMENT OF DISEASES OF WOMEN.** Fourth Edition, rewritten by A. MARTIN, Professor and Director, and PH. JUNG, Chief Physician and Professor, of the University Gynecological Clinic at Greifswald. Only authorized English translation, written and edited by HENRY SCHMITZ, M. D., Chicago. With 187 illustrations. New York: Rebman & Co., 1912.

The German edition of this work has met with a very favorable reception abroad and as the authors endeavored to present in a concise manner, contemporary, and particularly German gynecological practice, the English translation should prove of interest and value. Therapeutic procedures based on a thorough knowledge of the pathology of the various gynecological diseases, is the keynote of the original work, which, with the exception of introductory chapters on local anatomy and gynecological examinations, is devoted entirely to the former, leaving out theories and controversial discussions. Following the chapter on menstrual disturbances, a considerable portion of the book is

devoted to the pathology of the uterus, and the remainder is given up to a discussion of the diseases of the tubes, ovaries, pelvic connective tissue, and peritoneum. The original German work satisfactorily carries out these intentions, but on reading the English translation one is less satisfied with the same and fails to be impressed. In the reading of any text-book the mind should not be disturbed by false constructions or idiomatic translations, as these necessarily detract from the attention. In this instance, as in others met with during recent years, the translation is apt to be very literal and the retention of idiomatic constructions, etc., is often more amusing than dignified. The Germans are very fond of retaining the Latin names of various anatomical features, a habit which hardly ever obtains in English literature, likewise, such phrases as *experimenti causa*, *excavatio recto uterina*, and others too numerous to mention. Although the translator claims to have edited this work in conformity with American practice, a perusal of the same seems to show a lack of such supervision. Here, there, and everywhere terms creep in which will not be understood by the English reader, an example of which is shown on page 118, where a binder is described as being made of fustian material, whatever that may be. In Martin's original work the endeavor was made to present therapeutic procedures based on a thorough knowledge of the pathology of the various gynecological diseases, a very worthy intention and one that would have been much more thoroughly conveyed to the English reader if the translation had been more carefully made. The book is well typed and bound, but the illustrations leave much to be desired. Most of them have a worn-out look, and are so monotonous in appearance that they detract very greatly from the general interest. The retention of the first person in the translation is also confusing, and although a personal attitude may be desirable in certain respects, it is rather confusing where a book has been written by two authors, and neither one states his own conclusions. Under such circumstances the editorial *we* would have been more effective and desirable.

MOTHER AND BABY, HELPFUL SUGGESTIONS ON ALL IMPORTANT SUBJECTS CONNECTED WITH MOTHERHOOD AND THE CARE OF LITTLE ONES. By ANNE B. NEWTON, M. D. Illustrated from Photographs chosen by the Author. Price \$1.00. Boston: Lothrop, Lee and Shepard Co.

Although written by a physician, this book is not intended as a substitute for a doctor's advice and attention. The author believes that a physician should be selected long before a child is born, and claims that her book merely contains the ordinary regulations for hygienic living which will not prove contrary to the judgment of any regular physician. Only the simpler means for treating a sick child and descriptions of the commoner ills which are met with are included, because the writer believes, and wisely, that a discussion of actual diseases is out of place in a

book intended for the laity. The little book constitutes a very serviceable manual to be given to a mother before her impending confinement, as the facts in connection with this period are plainly stated and illustrated whenever possible by concrete examples. At the end of each chapter there is placed a recapitulation of its contents. In view of the excellent character of the work as a whole, one is apt to wonder why the author was not more careful in some of her statements, such as a reference to the use of a solution of carbolic acid for washing the breasts during pregnancy. Just what particular function is to be subserved by this process is not stated, and the direction to employ "ten or fifteen drops of carbolic acid in a bowl of water" is of doubtful expediency. The use of olive oil for massage of the abdomen for a few weeks before labor is likewise questionable, for unless most carefully carried out, it might lead to the production of labor pains. One of the very important features in the book is concerned with the author's effort to make parents appreciate the close connection between physical and moral health and how to maintain the balance between them.

**PHYSICAL DIAGNOSIS.** By RICHARD C. CABOT, M. D., Assistant Professor of Medicine in Harvard University. Fifth edition. Revised and enlarged, with 5 plates and 268 figures in the text. 519 pages. New York: William Wood and Company, 1912. Price \$3.00.

A new edition of a standard work such as this deserves the welcome which is accorded to an old friend. Unusually free from errors and contentions points in the early editions, the changes have been chiefly in the nature of additions necessitated by the progress of medical science. In the section on Blood Pressure the writer expresses his conviction that for clinical work instruments of the Riva-Rocci type are best and limits his description to these. One of the chief additions in this volume is a chapter on Arteriograms, Phlebograms, and Electrocardiograms. The author believes that neither sphygmograms nor electrocardiograms will be likely to be used by the general practitioner, hence he omits all reference to technic and gives only a brief statement of the results which these methods of study yield as regards heart block, auricular fibrillation, paroxysmal tachycardia, premature contractions of auricle or ventricle, and coupling of beats and alternation. These studies have also necessitated some alternations in the section on Disturbances of Rhythm. The discussion on Neoplasms of the Lung and Mediastinum are amplified and a short description of Subphrenic Abscess is included in this edition. We know no more practical work on physical diagnosis.

H. D.

**A PRACTICAL MEDICAL DICTIONARY** of words used in medicine with their derivation and pronunciation, including dental, veterinary, chemical, botanical, electrical, life insurance and other special terms; anatomical tables of the titles in general

use, and those sanctioned by the Basle Anatomical Convention; Pharmaceutical preparations official in the United States and British Pharmacopœias and contained in the National Formulary; chemical and therapeutic information as to mineral springs of America and Europe, and comprehensive lists of synonyms. By THOMAS LATHROP STEDMAN, A. M., M. D., Editor of "Twentieth Century Practice of Medicine"; Editor of the "*Medical Record*". Second revised edition. 1028 pages. Illustrated. New-York: William Wood and Company, 1912. Price, plain, \$4.50; thumb-indexed, \$5.00.

The congratulations of all authors will be extended to Dr. Stedman upon his early opportunity for correcting the typographical and other errors which inevitably mar the first edition of any work. The users of the dictionary may well congratulate themselves that such errors, so important in a work in which accuracy is essential, are so soon expunged. The writer has availed himself of this opportunity, moreover, to add over 2000 new titles and subtitles. The characteristics of Dr. Stedman's dictionary were described and discussed in the review of the first edition (*AMER. JOUR. OBST.*, July, 1911, p. 144), and we have no criticisms to add to our favorable estimate of the work. It appears in the same general form, with a flexible leather cover.

H. D.

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## BRIEF OF CURRENT LITERATURE.

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### OBSTETRICS.

**The Influence of Age on Pregnancy.**—Marek (*Gynäk. Rundschau*, Bd. vi, H. 15) discusses the influence of age on the first pregnancy, labor, and puerperium, in a series of 1000 primiparæ who came under his personal observation. He considers that this influence cannot be disputed. The number of miscarriages in elderly primiparæ is much less than usual, but the premature labors are unusually large. Albuminuria and the nephritis of pregnancy occur more frequently in proportion to the age of the patient and the course of these complications is likewise more serious. Eclampsia is also more common in older primiparæ, but the percentage of mortality is higher in younger women. The most frequent complication after labor in young primiparæ is atonic hemorrhage, but this is usually easily treated and without serious consequences. The most favorable time for the first labor is the period previous to the twenty-third year, as the smallest number of complicating conditions during pregnancy, labor, and the puerperium are noted during this time. After the twenty-third year the number of abnormal labors increases.



The principal cause of trouble in elderly primiparæ is due to uterine inertia and rigidity of the soft parts, which are apt to result in weak pains, premature rupture of the membranes, increase in operative interference, and heightened mortality of the mother and the child. The necessity for more frequent examinations, and either premature or delayed operative interference are also causes of future trouble. Marek insists, therefore, that in such women the pregnancy must be carefully watched and the labor preferably conducted in a hospital. The morbidity of the puerperal women also varies with the age, an increase being noted in the primiparæ. The effect of the age on the children was shown in the following observation: namely, that with advancing age of the mother a preponderancy of male children resulted, an increase in the number of pathological positions, and also in the number of dead or macerated fetuses.

**Influence of the Age of the Mother on the Sex of the Child.**— Ahlfeld (*Monatsschr. f. Geburtsch. u. Gynäk.*, September, 1912), who on a previous occasion has stated that the proportion of male children in elderly primiparæ was 137 to 100 female babies, whereas the usual number was 106, now contributes a further study based on 8000 cases of labor, among which were 280 mothers whose age was between thirty and forty-nine years, and among whose children were 151 girls and only 129 boys, a marked contrast to the previously obtained figures. Ahlfeld believes that the sex is decided in the ovum before fertilization. Under what circumstances either male or female ova are fertilized is still a matter of uncertainty. That the mother's age is evidently not a principal factor is shown by the differences obtained in the two series of statistics already quoted. It would appear to be necessary to make use of a much larger material. Ahlfeld considers, in view of the contradictory statistics, that we must revise our opinion about the larger proportion of male to female births in elderly primiparæ, and that the age of the patient is evidently not a factor in the matter.

**The Topography of the Umbilicus in Women and the New-born.**— Kakuschkin (*Monatsschr. f. Geburtsh. u. Gynäk.*, September, 1912) has made a great many observations on cases in Schirschou's clinic in St. Petersburg, and finds that the individual variations in the distances of the umbilicus from the ensiform, the symphysis, and the anterior superior spines, vary considerably, the difference amounting to as much as 14 cm. All these measurements are greater in older nulliparæ than the average of an adult woman. Previous labors do not seem to influence the size of these measurements. During pregnancy the lower portion of the abdominal wall is distended the most, and all the diameters in multiparæ at this time show a much greater increase than in primiparæ. The greatest enlargement during pregnancy is found in the left spino-umbilical diameter. During the first days of the puerperium the distance between the ensiform and the symphysis becomes reduced to such an extent that it is less than the average measure-

ment in an adult woman. The greater the weight of the infant, the higher the umbilicus in relation to the length of the child. In girls the umbilicus in relation to the latter is higher than in boys. In full term fetuses which are born by the breech, the umbilicus is higher in proportion to the length of the body than in those which have been born as vertex deliveries.

**Iodine Content of the Ovary.**—Zoeppritz (*Münch. med. Wchnschr.*, August 27, 1912) discusses the question whether iodine is a constant component of the human ovary or whether it is retained in this organ as the result of the administration of iodine combinations. The method of determining the amount of iodine was that developed by Rabbourdin, which was first tried out in pigs' ovaries. Thirteen human ovaries were examined which were taken from women to whom no iodine had been administered. In none of these could the iodine be demonstrated, which is in contrast to the assertions made by Neu and Wolf (*Munch. med. Wochenschr.*, 1912, p. 72) who claim that each gram of fresh ovarian substance contained 0.64 mg. of iodine. Ovaries taken from women who had received iodide of potash before operation were also examined and a similar lack of iodine demonstrated.

**Biological Diagnosis of Pregnancy.**—Frank and Heimann (*Berl. klin. Wchnschr.*, September 2, 1912) employed the procedure developed by Abderhalden in a series of thirty-three cases, in which his claims were fully confirmed. In all of these only one or two menstrual periods were skipped and the physical examination was negative or uncertain. Twenty-three cases returned for later observations, in twenty-one of which the positive reaction was confirmed by subsequent physical examinations. In six of these the reaction was negative and notwithstanding the amenorrhea, they were subsequently found not pregnant. From a series of tests made in the puerperium it was found that a positive reaction remained until the seventh day, but after the thirteenth day was always negative. It was immaterial whether these women had gone to term or aborted. In one instance where an extrauterine pregnancy was suspected, the test was positive and operation showed an inflammatory condition in both adnexæ, but no signs of an ectopic gestation. Subsequent inquiry elicited the fact that the patient had had an abortion before admission to the hospital. The same result was secured in a second case, which demonstrates that the test is not applicable in deciding whether or not operation should be done in such cases. The writers believe that the reaction possesses a great theoretical interest, but its technic is too difficult and the results too uncertain to be employed in general practice. Until some other method is devised for observing the dialysis, the general application of the test must be postponed.

**The Calcium Content of the Blood in Women.**—Lemers (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxi, H. 1-2) working in Veit's clinic has devised a practical method for making a quantitative determination of this element in the blood, in which the blood cells are

separated from the plasma by centrifugal action. The author denies that the blood cells contain any calcium in appreciable amounts. From examinations in thirteen pregnant women in the latter months, 11.67 mg. of calcium in 100 c.c. of plasma were obtained. In nonpregnant women this figure was 10.81 mg. per 100 c.c. It was found, moreover, that the increase in the calcium content of the blood plasma during pregnancy began after the third month, as soon as the fetal requirements for this salt became manifest. It has also been demonstrated that a certain increase in the calcium content in the maternal blood occurs as soon as the labor pains begin, but the writer is not prepared to discuss this relationship. In four cases of eclampsia in which the blood was examined for the purpose of determining the calcium content, a diminution of the same could be distinctly determined in contrast with the normal conditions.

**Repeated Spontaneous Rupture of the Uterus.**—Becker (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxi, H. 1-2) has collected from the literature, twentyseven cases in which this accident occurred and adds a carefully observed case of his own. The latter was a woman of twenty-eight, who presented a slight contraction of the pelvis. Six years previously, during her first labor, she developed a spontaneous rupture of the uterus, from which she recovered under conservative treatment consisting of tamponade of the organ. In the second pregnancy a similar condition developed and a macerated fetus 40 cm. in length was delivered. A rupture through the uterine wall could be demonstrated and the severe peritonitis which subsequently followed prompted the performance of a laparotomy. The tear was then seen to extend along the posterior aspect of the uterus from the attachment of the broad ligament to the fundus. The patient died soon after operation. In cases where a previous rupture has occurred the author therefore advises the induction of labor in subsequent pregnancies.

**Hematomyelia as a Complication of Eclampsia.**—Liebich (*Zentralbl. f. Gynäk.*, Bd. xxxviii, 1912) reports an interesting case in which after an eclamptic seizure the patient complained of severe pains in the neck and the right shoulder. During the puerperium a paralysis of the extremities followed, together with a complete anesthesia of the limbs and the trunk down to the second intercostal space. The recovery from both of these conditions was very slow and a complete restoration of function was not secured. Liebich believes that an acute damage to the spinal cord with the interruption of the various nerve tracts resulted from a hemorrhage, as acute myelitis, poliomyelitis or spondylitis could be excluded by the history. From a study of the physical side, the site of the hemorrhage was believed to be at the level of the eighth cervical, and the first and second dorsal segments. The fact that the motor disturbances were localized on the right side and the sensory on the left seems to show that the site of the bleeding and the softening involved

more or less of the gray substance of the right side of the cord. His observations also led him to believe that the hemorrhage occurred between the convulsive seizures, of which there were three. It is probable that in this case the excessive muscular exertion which accompanied a difficult labor, together with the high blood pressure and a condition of the vessels similar to what occurs in arteriosclerosis, favored the production of this hemorrhage. Liebig considers that this complication must be regarded as directly due to the eclampsia.

**Comparative Danger of Intra- and Extraperitoneal Infection.**—Baisch, of Döderlein's clinic (*Arch. f. Gynäk.*, Bd. xcvi, H. 2) attempted to arrive at a solution of this question by injecting a series of animals with cultures of hemolytic strepto- and staphylococci, and also hemolytic colon bacilli, either into the subcutaneous cellular tissue or the peritoneal cavity. It was found on subsequent examinations of the animals that the extraperitoneal infection was not any more serious than the intraperitoneal, or more often fatal in cases where the intraperitoneal infection had been overcome. Baisch believes, moreover, that the connective tissue is in a position to ward off infection when the perineum has already been overcome. It is only with large doses of infectious germs, the virulence of which has been increased by passage through an animal, that fatal infections can result from the connective tissue as readily as from the free peritoneal cavity.

**The Treatment of Abortions.**—Patek (*Arch. f. Gynäk.*, Bd. xcvi, H. 2) has studied a series of 1012 abortions which occurred in the gynecological service of the "Krankenhaus" in Vienna. He advises the radical treatment for all the incomplete cases, and in the impending abortions is guided by the particular indications present in the patient. He believes that a curetage is indicated in every appropriate case whether fever is present or not, and independent of any bacteriological findings. Of the twenty-six fatal cases in this series, twenty-four presented more or less extensive peritonitis at the time of admission, and in ten of these a conservative method had to be adopted because of the hopeless condition of the patient. In two cases of localized peritonitis the pus was evacuated through a vaginal incision. In three cases of diffuse peritonitis laparotomy was done, and in two cases of incomplete abortion with peritonitis the decomposed placenta was removed before laparotomy. In 889 cases of incomplete abortion treated by radical means, ten deaths resulted, in nine of which peritonitis was already present. Patek therefore considers that his mortality may be placed at 0.11 per cent.

**Cysts of the Placenta.**—Baldowsky (*Arch. f. Gynäk.*, Bd. xcvi, H. 2) discusses the origin of the subchoroidal cysts of the placenta from a certain number of personal cases which he examined. He finds that the small placental cysts are derived from decidual septa, whereas the larger cysts are derived in part from the combination of the smaller tumors, and in part

from the disintegration and fluid degeneration of the white infarcts of the placenta. The white placental infarct is in fact a fibrous nodule due to a degenerative process in the maternal decidua. The glycogen reaction is a proof of the decidual origin of placental cysts and infarcts.

#### GYNECOLOGY AND ABDOMINAL SURGERY.

**Gynecologic Disease in the Insane.**—F. J. Taussig (*Jour. A. M. A.*, Aug. 31, 1912) discusses this question with particular reference to the percentage and exact character of gynecologic lesions found in insane women, and above all the relationship of such lesions to the different forms of insanity. Taussig's study is based on examinations made in a series of 537 women inmates of the St. Louis City Sanitarium, of which 252 were found to have some lesion in the pelvic organs sufficient either to cause symptoms or to be in a position to cause them sooner or later. Minor abnormalities were disregarded, but in about one-fifth of the women showing gynecologic disease more than one lesion was found (47 per cent.). It seems probable, therefore, that gynecologic disease is only slightly more common in insane women than in the sane, the real point of interest being the distribution of these lesions among the different forms of insanity. In three of the important groups, senile dementia, terminal dementia, and paranoia, the percentage of women with pelvic trouble was only about one-third. In dementia precox about one-half the women were diseased. About two-thirds of the imbeciles could be so classed, and in the maniac-depressive group the percentage was as high as 74 per cent. In only 141 cases out of the total number was gynecologic treatment required, forty-seven of these being put on conservative measures. Ninety-four patients belonged to the possible operative class, or 17 per cent. of the total number examined. Only seventeen, however, were subjected to treatment. Taussig believes that there are three facts pointing to some sort of relationship between gynecologic disease and maniac-depressive insanity. These are: 1. The decidedly greater frequency of gynecologic disease in this form of insanity (74 per cent. as compared with an average of 47 per cent.). 2. The large proportion of chronic inflammatory conditions of the genital tract. 3. The proportionately large percentage of mental recoveries after gynecologic operations done on women having this form of insanity (17 per cent. recovery, 17 per cent. improved, and 66 per cent. unchanged). The author concludes, therefore, that in maniac-depressive insanity every patient should be subjected to a gynecologic examination, and that when a definite lesion is found this should be corrected either by local or operative measures.

**Corpus Luteum Extract in Gynecology.**—C. F. Burnam (*Jour. A. M. A.*, August 31, 1912) presents the results of his observations with this substance in contrast to the ordinary ovarian



extract in cases of ovarian insufficiency in women. Tablets of this substance, when freshly made, seemed to be as effectual as the raw material and were employed in doses containing 20 grains of the fresh corpus luteum of the sow. Little or no toxic effects were observed even in large doses and the substance seemed to control the nervous symptoms in patients at the menopause, whether natural or artificial. The extract also seemed to be of value in cases of insufficient internal ovarian secretion during the menstrual life, and was found efficient in inducing menstruation in young women suffering from functional amenorrhea. It was also found that when these patients were fat a reduction in weight usually occurred. The author believes that the corpora lutea of other animals should also be employed in order to determine their value in comparison with that of the sow. From clinical experiences Burnam is inclined to believe that corpus luteum possesses different properties due to different chemicals. One of these substances causes hyperemia of the pelvic organs, another relieves nervous symptoms of a toxic character, as at the menopause. It would seem as if this product acted as a neutralizer, since even large doses of the same cause no disturbances of a toxic nature. On the other hand, the toxic results of intravenous injections of the lutean extracts, as well as the nervous phenomena of menstruation, show that there must also be some toxic material present which is not absorbed from the stomach or the intestines. He believes that in the future these various substances may be separated.

**Immediate Operation for Tubal Pregnancy.**—Ladinski (*Jour. A. M. A.*, September 14, 1912) advises the immediate operation in these cases as soon as the diagnosis has been made, in the general belief that hemorrhage in the peritoneal cavity must be sought for and checked as soon as possible. Opening the abdomen of a patient profoundly shocked and anemic from abortion or rupture of a tubal pregnancy does not *per se* offer a graver risk than opening the abdomen for any other intraabdominal condition and furthermore, delay in operating no matter how slight, means increased risk, greater danger, and probably death to the patient. He cites an instance of death from hemorrhage within two hours after rupture of an ectopic pregnancy, and from his observations on 200 cases is firmly convinced of the necessity for immediate operation. In these 200 cases there were three deaths, one following immediate operation in an unruptured tubal pregnancy, one following deferred operation for ruptured tubal pregnancy, and one following deferred operation for terminated ruptured tubal pregnancy with infection. Among all the immediate operations there was one death, but in two deferred cases both patients died.

**A New Procedure for the Repair of the Vagina in Prolapse Cases.**—Reed (*Lancet-Clinic*, September 7, 1912) describes an operation which he calls "superior colporrhaphy," which has for its object the restoration of the integrity of the vagina at the



pelvic diaphragm, which is that continuity of structure stretching more or less irregularly across the pelvis at the upper extremity of the vagina. With the patient in the dorsal position, the posterior wall of the cervix is seized at its juncture with the vagina and drawn downward and forward. The vaginal membrane is now incised at the cervicovaginal juncture, transversely from one fornix of the vagina to the other. From a point at the middle of the incision, another incision from 4 to 6 cm. in length is made vertically downward in the vaginal wall. The triangular flaps thus outlined are dissected back, exposing the retracted margins of the vaginal sphincter muscle, the cellular tissue, and the more or less attenuated striæ of the uterosacral ligaments. The culdesac is then pushed out of the way and a series of silkworm-gut sutures inserted, embracing the uterosacral ligaments of both sides and the retracted sphincter muscle and connective tissue. The loose ends of these sutures are crossed over and drawn to approximate the deep layers, but are not tied. The redundancy in the vaginal mucous membrane is now cut away by trimming back the flaps. The ends of each suture are now crossed over and inserted through the opposite vaginal flap, thus making it a figure-of-eight suture, after which they are all tied. In cases of complete tear of the perineum with cystocele in the lower zone, the two operations may be done at once.

**Biliary Colic without Gallstones.**—Haynes (*New York State Jour. Med.*, September, 1912) discusses the class of cases in which biliary colic is present, although gallstones are not found at the operation as expected. He considers that it is practically impossible to construct a symptomatology by which we can differentiate a calculus from a noncalculus biliary colic. He believes, however, that one striking feature in the latter class of cases is that the patients have many attacks without any very serious results, so that on the average it will take a great many more attacks of colic without gallstones to drive the sufferer to seek surgical relief, than where the calculi are the cause of the colic. Furthermore, the patients do not look as sick as would be expected from the duration of the disease and their account of the severity of their symptoms. Fatigue seems to be an important factor in bringing on these attacks and indigestion seems to have very little to do with them. Jaundice is not present or very transient, the urine and feces do not contain any bile and the temperature, pulse and respiration are normal. There are no blood changes unless an acute attack with infection supervenes. Haynes considers that medical treatment is only of value in a prophylactic manner, that if the condition is once established surgical intervention is necessary, a cholecystectomy being required. Adhesions cannot be satisfactorily guarded against in such cases by the introduction of any foreign membranes or other substances.

**Experimental Devascularization in the Intestine.**—Horsley and

Coleman (*Jour. A. M. A.*, August 24, 1912) present a report of experiments undertaken with the idea of determining the difference in the effect on an animal when devascularized segments of intestine were obstructed at both ends, or when such segments were unobstructed and their products allowed to flow freely into the normal bowel. Ten dogs were subjected to operation, including separation of the mesentery with tapes on the devascularized intestine and separation of mesentery without tapes on the same. The view usually held that the bowel with impaired nutrition can be easily permeated by bacteria, was not borne out by the experiments. In no instance did the dog die in less than three days except when perforation had occurred and the bacteria and other intestinal contents were thrown in an overwhelming amount into the abdominal cavity. In such cases death took place in a few hours. A short segment of intestine in a dog when deprived of its nutrition, if thoroughly protected by omentum, may be nourished through the omentum and maintain its integrity. It has been taught that even if a small portion of intestine becomes detached from its mesentery, gangrene and a fatal result necessarily follow. The authors claim that this is not true in dogs. The occurrence of mechanical obstruction along with gangrene, such as would occur in strangulated hernia, intussusception and volvulus, adds a great deal to the gravity of the situation. Devascularization of a segment of bowel without obstruction, as when the intestine is severed from its mesentery by a wound, seems much less serious than where there is obstruction. If such a segment is short and is protected by omentum, the condition appears to be compatible with recovery.

**Uterine Hemorrhage Associated with Pellagra.**—Peete (*Old Dominion Jour. Med. and Surg.*, August, 1912) calls attention to a symptom which he has noted in eight cases of pellagra, which consists of marked uterine hemorrhage appearing before the ordinary pathognomonic symptoms. The observation is presented by the writer with the intention of interpreting this sign as diagnostic of the possibility of pellagra.

## RESOLUTION.

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At a stated meeting of the Medical Board of St. Mark's Hospital of New York City held at No. 177 Second Avenue, in said City, December 3, 1912, the following resolutions were unanimously adopted:

*"Whereas,* Time in his unswerving course, has removed from our midst,

DR. CEASAR A. VON RAMDOHR,

an associate, who was one of the founders of our hospital, knowledge of whom engendered not only respect for his honesty of purpose and indomitable courage of conviction but personal affection because of the uniform kindly courtesy of his deportment.

*"Whereas,* His faithful services abundantly show his unswerving attention to duty, and these services, eagerly sought by those suffering, made him endeared to every professional and lay member of the hospital, and his counsel was often asked, and eagerly accepted, as it was cheerfully given.

*"Whereas,* In his life he had acted to his professional brethren who were troubled in their career, with the utmost consideration, with unusual kindness and courtesy, and his services were sought and given cheerfully.

*"Whereas,* His genial companionship, his uncommon charm of manner and courtliness of address, attracted and held the admiration and affection of all with whom he came in contact. Therefore be it

*"Resolved,* That the sympathies and condolence of the members of the Medical Board of St. Mark's Hospital of New York City be and hereby are extended to the bereaved family, and furthermore be it

*"Resolved,* That these resolutions be spread upon the minutes of the medical Board and published in the principal papers of the *Medical Press*.

Ignatz Morvaj Rottenberg, M. D.  
Benjamin T. Tilton, M. D.  
Andrew Von Grimm, M. D.

## ITEM.

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The Committee in charge of the Merritt H. Cash, \$100.00, and Lucian Howe, \$100.00, Prize Fund of the Medical Society of the State of New York, offer the suggestive, but not arbitrary, subjects upon which the competitors may write their essays:

1. Diagnosis and treatment of syphilis of the central nervous system.
2. The present status of serum therapy.
3. Latest research relative to cancer.
4. The order and sequence of vascular and cardiac disease.
5. The function of the State in limiting the increase of imbeciles and degenerates.
6. Surgery in functional and organic disorders of the stomach.

The essays must be in the hands of the Chairman of the Committee, Dr. Albert VanderVeer, 28 Eagle Street, Albany, N. Y., not later than April 1, 1913.

Committee:

Dr. John F. W. Whitbeck, 781 Park Ave., Rochester, N. Y.

Dr. Edward D. Fisher, 46 East 52d St., New York.

Dr. Albert VanderVeer, 28 Eagle St., Albany, N. Y.

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## CORRECTION.

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IN the discussion on the papers of Drs. Bell, Davis and Ziegler in the December JOURNAL, the lines from the middle of page 972 to the bottom of page 973 beginning: "We tried the effect of change in posture" . . . . should be credited to Dr. CHARLES EDWARD ZIEGLER, as his closing remarks.

# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### THE PREPARATORY TREATMENT FOR NURSING AND CARE OF THE NURSING MOTHER.\*

BY  
EDWARD P. DAVIS, M. D.,  
Philadelphia.

THE preparatory treatment for successful lactation is based upon anatomical and physiological considerations.

A defect of development in the mammary glands is so common that all patients should be examined to determine the presence or absence of the normal anatomical conditions. Deficient development of the nipples, sunken nipples, congenitally fissured or cleft nipples, and lack of normal development of their epithelial covering, require attention. Deficient development of the glands through constriction by clothing, or failure in general physical development, is not uncommon.

For abnormal conditions in the nipple, mechanical treatment is often necessary. The sunken nipple can be most safely brought out by pressing gently with the thumb and finger at the areola, thus gently pushing the nipple from its sunken situation. It is also possible to draw out such a nipple by a breast-pump, but there is more danger of exciting uterine contraction by the vigorous use of the breast-pump than by everting the nipple through gentle pressure. The nipple may with advantage, be grasped gently by the thumb and finger and brought thoroughly outward from its base and held in that position for a few moments. It may not be possible to produce permanent protrusion of the nipples, but if they can be readily brought out the sucking of the child will usually do the rest.

Congenitally cleft or fissured nipples demand attention because the epithelium may be deficient and covered by a crust of dried

\*Read before a joint meeting of the Philadelphia Pediatric and Obstetrical Societies, April 9, 1912.

secretion in an irritated or even infected condition, which would invariably be followed by fissures and cracks when lactation developed. This state of affairs is best treated by gentle but thorough cleansing with castile soap and warm water, followed by the daily application of a mild antiseptic ointment. We have found an ointment composed of powdered boric acid 10 grains, lanolin 3 drams, white vaselin to make the ounce, most useful for this purpose. It should be gently but thoroughly rubbed in with the nipple grasped by the thumb and finger. What is desired in these cases is not to harden or tan the epithelial covering, but to secure the removal of the dry secretion and the abundant growth of healthy epithelium. This is needed to protect the nipple from the suction of the child's mouth.

For deficiently developed breasts from compression by tight clothing, all that can be done is to remove the compression and give the patient such gentle but general exercise as shall induce better conditions in the thoracic region. Massage of the breast is not advisable in pregnancy in sensitive women from the fear of exciting uterine contractions.

The physiological preparation for lactation is most important. The greatest obstacles to the successful performance of this physiological function are a disordered nervous system and the lack of physiological development in the ductless glands of the body. We are all familiar with the fact that many nervous patients fail in lactation. Some are neurasthenic because they are degenerates; others are hysterical; and others have some well-pronounced disease of the nervous system. In those who are nervous because sensitive only the stimulus of maternal affection may lead them to overcome the nervous condition. Those who are degenerate can sometimes be improved by stimulating the functions of the ductless glands. Those who are profoundly degenerate cannot perform lactation.

Of primary importance in preventing successful lactation is the toxemia of pregnancy, often induced by failure in the action of the ductless glands of the body. While our knowledge is very imperfect upon this subject, we know that a close relationship exists between the functions of the thyroid gland, the parathyroids and the secretion of the mammary glands. In cases of exophthalmic goiter, attempted lactation may be followed by alarming symptoms. The advent of lactation in all women is characterized by toxemia of a more or less transient character, in some cases sufficiently pronounced to produce marked changes



in the pulse and temperature of the patient. In some the lymphatic system is temporarily involved and there is pronounced nervous disturbance.

In all patients the avoidance of the toxemia of pregnancy will tend to further successful lactation. The obstetrician should be on the lookout for hypothyroidism from deficient development of the thyroid gland or colloid degeneration of the gland. The administration of small doses of thyroid extract in these cases, over long periods during pregnancy will be followed by benefit.

A study of the nitrogenous excretion of the patient is also valuable as determining the possibility of successful lactation. Where the toxemia of pregnancy is pronounced and persistent, the milk is unfit for the child, and lactation is not to be encouraged, but to be avoided so far as the infant's use of the milk is concerned. Regulation of the mother's diet during pregnancy, the stimulation of the excretory organs, the free use of water and of milk, stimulation of the skin, a plentiful supply of pure fresh air, and all the hygienic measures which are suggested in patients whose metabolism is deficient, are important in preparing for successful lactation.

In the matter of diet, the essentials during pregnancy are milk, fruit, and bread, and if one can ring the changes upon this trio the result is usually satisfactory.

To secure the successful formation of breast-milk and successful nursing on the part of the mother, septic infection during labor, no matter in how slight a degree, must be avoided; so also must exhausting hemorrhage and severe and exhausting labor. It is significant to observe that patients delivered by a surgical operation, without infection, hemorrhage or shock, and without prolonged labor, so often nurse the child vigorously and successfully. On the other hand, a patient with delayed and painful labor, terminated by a difficult forceps extraction, with many lacerations, hemorrhage and infection, will usually fail utterly in lactation.

Clinical observation has shown us that those drugs which stimulate a patient after labor, to recover from fatigue, and which cause uterine contraction, indirectly stimulate the formation of milk. Thus, tonic doses of strychnia are useful for this purpose. Small doses of ergot are not contraindicated. The toxemia which accompanies the formation of breast-milk should be anticipated by a free evacuation of the bowels. This does not hinder the formation of milk, but makes its quality better and establishes

a better balance between the patient's nutrition and the secretion of milk. In cases where the tension of the breast is excessive, an active purge assists greatly in lessening the difficulty, and gentle massage with the use of the breast-pump before the child nurses, will usually bring relief. It is unnecessary to restrict the patient's fluid food in these cases, as it is better to give plenty of fluids and to evacuate the intestine thoroughly and stimulate the kidneys.

To promote successful lactation, nursing at regular intervals is essential. The most frequent interval should be two and a half hours; the usual interval three hours. Once or twice at night, in proportion to the vigor of the infant and the condition of the mother, are indicated.

The mother's diet during lactation should be that most digestible and rich in easily assimilated proteids, fruit sugars, and vegetable fats. Milk and milk foods, cocoa, cooked fruits, toast, cornstarch, in cold weather cornmeal, preparations of whole wheat, cream of wheat, and strained oatmeal, are all useful. The tradition that tea favors the flow of milk, and that coffee inhibits it, rests upon no scientific basis. Neither should be taken in excess. The effect which tea and coffee produce upon lactation depends entirely upon the effect which they produce upon the digestion of the patient. Tea sots and coffee drunkards will crave their accustomed stimulant, during lactation, and a small quantity must be allowed. Those who use one or both in moderation need not necessarily abandon them entirely. The same may be said of the use of tobacco by nursing women. While tea, coffee, and tobacco are injurious, in confirmed users it may be necessary to allow a small quantity compatible with peace of mind.

We have yet to see a patient whose lactation was made better by the use of alcohol. There is abundant reason for believing that alcohol taken by the parturient woman exerts an unfavorable influence upon the fetus. If the nursing mother requires stimulation, there are other and better things than alcohol for that purpose. Malt preparations, whether alcoholic or nonalcoholic, should be used with great caution by nursing women. In some they upset digestion and produce a toxemic condition which is bad for mother and child. It is a mistake to suppose that large quantities of malt preparations are invariably beneficial during lactation.

It may be necessary, in the interests of the child, to modify

the mother's care during lactation so as to alter the composition of her milk. Where there is a persistent secretion of highly fatty milk the mother's proteid diet may be restricted and an abundance of water taken, and the breasts carefully but gently pumped before the child nurses. Where, on the other hand, the milk is deficient in fat and in proteids as well, proteid food should be increased, the breast stimulated by gentle massage, and the patient given a general tonic.

Undoubtedly the best tonic for stimulating metabolism of parturient women is arsenic. This combined with a bitter tonic may be used with advantage, increasing the dose of arsenic cautiously and avoiding its full physiological effect.

Much can be done to further the comfort of the nursing mother by mechanical treatment of the breast. A properly fitting, well-supporting breast bandage, makes her more comfortable, prevents undue distention of the lower portions of the breast, and conduces to successful lactation. Very gentle massage of the breasts from the circumference toward the nipple, with cocoa butter or olive oil, is also useful. The nipples should be kept in an aseptic condition by the use of boric-acid solution before and after nursing, and the nipples should be protected from irritation and infection by sterile gauze.

To avoid the toxemia following constipation during the puerperal period, those medicines should be used which do not purge the infant, nor excite irritation and griping in the mother. After the toxemia of initial lactation has been relieved by a purge and saline combined, licorice powder is most available. Preparations of cascara, in my observation sometimes produce irritation in the intestines of the child.

The familiar fact that mental agitation checks lactation, and may bring about a condition of toxemia which makes the milk poisonous to the child, suggests that the nursing mother should be protected so far as possible from all such disturbances. She should be relieved from household annoyances and care, certainly during her lying-in period, should have abundant rest, with comfort and fresh air, and encouraged to take a hopeful and happy view of her maternal duty.

After she has made a good obstetric recovery from parturition, experience shows that regular exercise, pleasant and stimulating occupation, favor successful lactation. Undue excitement, late hours, rich food, overburdened digestive organs, and the frittering

away of energy in those ways which exhaust without giving satisfaction, are all injurious to lactation.

The common belief that menstruation should interrupt lactation is not borne out by accurate observation. When the patient is under good care during menstruation and lactation, there is no further disturbance for mother and child than a temporary suspension in gain in the infant's weight. The mother must be kept quiet, however, during this period, sometimes remaining in bed for several days, and must take care that digestive disturbances do not occur.

Lactation must be considered a nutritive function, virtually independent of the sexual organs but liable to interruption through any changed condition in the reproductive system. This is illustrated by the fact that women from whom the uterus, tubes and ovaries have been removed at labor, are capable of nursing the child sometimes for an indefinite period.

250 South Twenty-first Street.

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## METHODS OF ENCOURAGING BREAST FEEDING AND CONTRAINDICATIONS TO BREAST FEEDING.<sup>1</sup>

BY  
M. H. FUSSELL, M. D.,  
Philadelphia.

WHEN your Chairman asked me to take part in the discussion this evening, I hesitated for a considerable time from the fear that I had but little to say that is original. It cannot be mere routine information you desire. Searching about in my mind for facts, however, impelled me to undertake the grateful task. According to Fischer, 90 per cent. of poor mothers are able to nurse their children, while only 17 per cent. of rich mothers are able to perform the same duty.

The subject has crystallized itself in my mind as follows: I say subject, for while my paper bears a dual title, I think the last is simply a corollary to the first.

Contraindications to breast feeding can be only those reasons which cannot or should not be overcome by careful painstaking means to increase the ability of a mother to nurse her child. Let us consider what are the real difficulties often encountered by the physicians, practically all of them considered contraindi-

<sup>1</sup>Read before the joint meeting of the Philadelphia Pediatric Society, with the Philadelphia Obstetrical Society, April, 9, 1912.

cations by the laity; most of them to be overcome by intelligent efforts on the part of the physician, helped by real cooperation on the part of the mother.

*First.*—A desire on the part of the mother to feed her baby on artificial foods.

I believe no mother worthy of the name should ask to be relieved from nursing her baby, unless she is convinced that the act of nursing will do either herself or her baby irremediable harm.

*Social duties* should certainly never be allowed to interfere with a mother nursing her baby. Notwithstanding the important work women are now doing in the world's active business, social and otherwise, there is no *duty superior* to that of rearing a healthy child who may thereby become a worthy member of the succeeding generations. It is beyond contraversion that an infant fed on the breast milk of a healthy mother is much more likely to live and grow into a healthy child than if it is fed on the most scientifically prepared artificial food.

This being the fact, the mere convenience of artificial feeding which may be attended to by a servant, or the greater ability to attend social functions of any sort gained by the freedom from nursing, should not be given a moment's consideration by the thoughtful physician or conscientious mother. The child should be nursed. I have seen women flatly refuse to do nursing without any reason, save convenience. I have no fit words for condemnation of such an attitude on the part of the mother. It is the physician's duty to bring all sorts of argument to bear, to convince her of her error.

*Physical inability* to nurse the infant.

This while it is certainly all too frequently present, often only exists in the fears or imagination of the mother. These latter, must whenever possible, be overcome. Reasons frequently given by the mother are the following: 1. Infected nipples; 2. mastitis in a previous motherhood; 3. a failure to nurse an earlier child; 4. fear that nursing will cause great debility; 5. baby will not want breast; 6. failure of secretion.

*Infected Nipples.*—It is small wonder that a woman whose nipples are torn, bleeding and suppurating, feels that this is quite sufficient cause for weaning the baby. The pain which accompanies each nursing by the child is certainly difficult to bear, and in addition each attempt at sucking the nipple makes the infection worse.

We as physicians, are too neglectful in failing to recognize this rather fertile source of too early weaning. Nomi says 59 per cent. of puerperal women have infected nipples. Treatment before the birth of the child, and before and after nursing will usually remedy the evil and allow normal feeding of the infant to continue.

Breasts of the expected mother should always be examined before the birth of the child. If the nipple is long and protruding, it should be daily washed with boric acid and a solution of tannic acid in glycerin applied with cotton for at least one month before the expected delivery. If, on the other hand, the nipple is inverted and inconspicuous, attempt to draw the nipple into shape must be made. This can be accomplished fairly well by the use of one of the better forms of breast pumps, the breast in the meantime being treated with some hardening material like tannic acid or alcohol. Cleanliness and care are the keynotes to prevention of infection. When the baby begins to nurse, the nipple should be first bathed with alcohol and then with boric acid. Immediately after the nursing, the nipple should be carefully dried by means of aseptic gauze, and then if there is the least tenderness the same glycerol of tannic acid can be used. The baby's mouth must be kept scrupulously clean by means of boric acid. This washing must be carefully done. If the nipple by neglect, or in spite of great care becomes infected, then the same insistent cleanliness must be persisted in. It is here best to suspend the nursing from the affected breast, but the flow of milk can be continued and the breast saved for the baby's use by regular use of the breast pump, the milk being fed to the baby by means of a spoon or other contrivance. Many times I have saved the milk for a baby by this means, while the mother begged for cessation of all interference with the breasts. After a few days the nipple will be healed and normal nursing may be recommenced. When the nipple first becomes tender, an ordinary nipple shield will sometimes cure, care must be taken however to see that the shield is boiled daily to avoid harming the child.

*Mastitis.*—A woman once having suffered the tortures of a suppurating breast, particularly if it has been allowed to ripen, always has an objection to nursing a subsequent child. Mastitis is practically always the result of infected nipples. Here the treatment is to *rest the infected breast*. Nurses constantly say they rub the breast well. Now in the presence of an



actual infection massage is bad. Unquestionably before infection, while the ducts are full and tender, massage properly done, gently from the periphery to the nipple, will empty the lobules and give ease, but if there is actual inflammation, I feel the rubbing is entirely unjustifiable. Early efficient evacuation of the pus is indicated, which is best done by a skilled surgeon, the function of the breast thus being occasionally maintained. If the woman is not too ill, the other breast must be used for nursing, either by means of the breast pump or actual suckling. Too often, however, in spite of our very best endeavors, this second breast fails to secrete and we are in the presence of one of the insurmountable contraindications to breast nursing.

*Former Inability to Suckle.*—One frequently meets with the condition in which the mother on one or more previous occasions has not nursed the child. The mother has a firm belief which amounts to almost an hallucination, that she will be unable to nurse the coming infant. In many instances, institution of such means as will be detailed further along, by tactful arguments, by arousing in the expected mother's mind a strong desire for nursing her baby, the milk will occasionally flow in sufficient amount.

*Fear of the Effect of Nursing.*—This is certainly a rather important element in persuading some women to forego the honor of lactation for her child. Usually it is founded on fear rather than upon reality, and should then be forced from the mother's mind, and she should nurse.

*Real physical disability* exists frequently enough to be a very serious hindrance. A patient ill with an infectious disease, as tuberculosis, scarlet fever, typhoid fever, and others, should not be allowed to nurse her child, not so much because of danger to the child, as from the danger that the added strain of lactation might readily cause a fatal termination of the malady of the mother. A mother in good health at the time of the birth of her child, unfortunate enough to contract syphilis, must not nurse her child, for she surely would give syphilis to her child.

*Failure of Secretion of Milk.*—The milk is diminished, either in quantity or quality from many causes, some of which are entirely remediable by careful treatment. That the treatment of the mother may be intelligently directed, it is necessary to make use of some apparatus, not too cumbersome or too complicated for practical use. The writer has made use of the com-

mon Holt apparatus. By means of this apparatus, one can estimate nearly enough for practical purposes the amount of fat and proteids in mother's milk, and treat the case accordingly. Evidences of insufficient or unfit breast milk are first shown by failure of the child to gain in weight, or by its actual loss of weight, or by vomiting, diarrhea, or restlessness. If the breast milk is found to contain too much fat, the patient should get an abundance of exercise in the open air, and her nitrogenous foods, meats, milk, eggs, animal broths, etc., must be cut down and replaced by a more vegetable diet.

Too great an increase of amount of feeding is apt to increase the amount of proteid. The obvious remedy of reducing the amount of food and increasing the amount of exercise must be employed.

We all come across cases where the mother has an abundance of milk during the first few days or weeks, the breasts are large and fat, the mother is apparently in perfect health, and yet, suddenly, and in spite of the efforts above described, the milk fails beyond help. For this there seems to be no remedy.

*Intervals of Feeding.*—The intervals of feeding must be regulated, two-hour intervals during the day is that which best regulates the function of the breast, while it at the same time best nourishes the child. For an infant to nurse all day, or all night, to be given the breast every time it cries, is sure not only to derange the child's digestion, but to alter the milk supply which may necessitate weaning.

*Mental Conditions of Mother.*—Sudden fright or mental disturbance of the mother may so alter the food that the child is literally poisoned by it. Continued mental worry constantly changes the character of the breast milk. Hence, all sources of worry, sleeplessness, etc., must be removed, and the mother put in a state of equanimity. "Don't Worry" impressed on the mind of every nursing woman would do much toward the continuation of good nutritious milk.

*Exercise,* daily taken in the open air or resting in the open, each case studied by itself so that the mother may get an abundance of air and exercise without accompanying exhaustion, is one of the almost absolute necessities of continued good breast milk.

*Diet of Mothers.*—This should be nutritious and easily digested. Ordinary mixed diet, with avoidance of pastry and other unfit

articles, is desirable. What has been said about the solids in the milk, here is to be employed.

Menstruation in a nursing mother is not of necessity a cause for discontinuence of nursing. So long as the milk continues in good condition and the baby thrives, it may be allowed to nurse.

Pregnancy usually causes poor milk and weaning becomes necessary.

Finally, while breast feeding is the best and most natural method of nourishing an infant, breast milk, distinctly unfit, should not be continued. If an earnest and prolonged effort has been made toward getting good breast milk, and the baby still does not thrive, as shown by the loss of weight, then the baby had best be weaned and put upon a milk mixture of known value.

This whole subject, to speak about, seems easy. No more difficult task, however, confronts the physician than regulations of a woman's life and surroundings so that her milk, when it begins to fail in quantity or quality, may be restored to normal.

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## JOINT MEETING OF THE PHILADELPHIA PEDI- ATRIC SOCIETY WITH THE PHILADELPHIA OBSTETRICAL SOCIETY

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*April 9, 1912.*

Papers were read as follows:

DR. EDWARD P. DAVIS read a paper on

THE PREPARATION FOR NURSING AND THE CARE OF THE NURS-  
ING MOTHERS.\*

DR. BARTON COOKE HIRST read a paper on

DISEASES OF THE BREAST NOT INTERFERING WITH LACTATION.

THIS division of the subject excludes such affections as suppurative mastitis, mastitis carcinoma, tuberculosis of the mammary glands, actinomycosis and so on. There are a number of other mammary diseases, however, not incompatible with lactation. These are congestion, the milder grades of mastitis, benign tumors, hypertrophy and all the diseases of the nipples short of extensive ulceration.

A mammary binder with massage, an ice-bag or hot fomentations and camphorated oil makes nursing possible, even with

\* For original article see page 178.

intense congestion or actual inflammation of the breast which stops short of suppuration. An adenoma of the breast as large as a cocoanut may be removed in the first few days of the puerperium without interfering with the function of the gland, as I know from experience. Excessive hypertrophy of the breasts in which one of the mammæ reach a monstrous size, for the disease is usually unilateral, might seem to contraindicate nursing, but clinical experience shows that suckling the infant does not add to the hypertrophy of the breast. On the contrary it has been seen to diminish its size. While supersensitive, fissured, excoriated and ulcerated nipples are extremely painful to the patient and sometimes tax the therapeutic ingenuity of the physician to the utmost, they need not necessarily prevent nursing. Applications of an ointment of equal parts of bismuth subnitrate and castor oil, extract of witch hazel, compound tincture of benzoin, nitrate of silver solutions and the solid stick, diminish sensitiveness and hasten the cure. Lead nipple shields protect the nipples from the painful pressure and rubbing of the mammary linder, and the nursing nipple shield of glass and rubber or the soft rubber shield called "Infantibus" make possible the application of the baby to the breast that without these mechanical devices would cause intolerable pain.

DR. M. H. FUSSELL read a paper on

#### METHODS OF INCREASING THE MAMMARY FUNCTION AND CONTRA-INDICATIONS TO NURSING.†

##### DISCUSSION.

DR. RICHARD C. NORRIS.—This matter of baby feeding passes very early and very properly out of the hands of the obstetrician and the responsibility rests largely upon the pediatricist. So far as ability of the woman to nurse the child is concerned the obstetrician has her under observation only for a very short period. In my hospital work at the Preston Retreat bottle-fed babies are practically unknown. Very rare are the women not able to nurse their babies in the first few weeks of convalescence. How long they continue nursing after they leave the hospital and pass into the hands of the general practitioner, I do not know. In my private cases, where I have opportunity to trace the patients, I am quite sure that the greater the mother's culture, refinement and intelligence, the less do I find the disposition to shirk nursing the baby. I think the better class of women have begun to come back to their mothers' and grandmothers' viewpoint. Of course there are exceptions, and occasionally we find a careless and indifferent woman, but thoughtful mothers among the better class of women certainly try to nurse their babies. Many have to abandon nursing because of physical unfitness. I know of no law of nature so inexorable in its demand upon woman's physical powers and

†For original article see page 183.

especially her nervous system as that required for nine months of pregnancy, for the ordeal of labor, and for the physical strain of nine or more months of lactation. There are two sides to this question. To encourage or insist that some women continue nursing so long as the baby thrives, and forget the possible ill-effect upon the mother, will certainly add to the army of neurasthenics these women physically ill-equipped for the demands of maternity. I believe the statistics brought out tonight would be entirely different, if the medical profession would generally acquire, and then educate the mothers in a knowledge of scientific baby feeding. There are certain cases that must go into your hands, Gentlemen, and when such mothers first know how to feed their babies properly we shall have better results.

Another point is that we should utilize the breast milk as long as we can. In this discussion no one seems to have laid sufficient stress upon combined feeding. The mother should be taught the earliest signs of deficient milk and that when her milk begins to fail she should seek instruction in the combination of breast and artificial feeding. The problem lies with the pediatricist more than with the obstetrician, and we must look to a wider and better knowledge of artificial feeding to aid in lessening infant mortality as well as to a campaign of urging capable mothers to nurse their babies.

For inverted nipples it is my experience that little can be done in the way of ointments, massage or breast pumps. The baby is the best means of drawing them out and if it fails I have found nothing else that will succeed, unless it be a shield brought to my attention by Dr. Griffith some time ago, called the "Infantibus." The shield acts like an old fashioned "sucker" in that when moistened with water and pressed against the breast it takes hold of a wide area of the breast and when the baby sucks the rubber nipple a very wide vacuum is produced. I have had several patients use this shield during the last month or two and it has been the most satisfactory mechanical appliance for inverted nipples that I have ever seen. Without it breast feeding would have been impossible for these cases.

In the preparation of the nipples for nursing I think we have made many errors. Astringent preparations, ointments and the like, are of little real service. I believe that if the woman will keep the nipples clean by bathing with a bland soap and water daily this will do as much good as any medicine.

Regarding the care of the nipples during the nursing period, I think the more we do in the way of astringent or cauterizing applications, the worse they get. I have seen nipples in bad condition heal up very promptly when the lead nipples described by Dr. Hirst were worn continuously. I have thought this good result was because the nipples are protected, kept clean and we let them alone. For a deep fissure there is nothing better than a single light application of trichloroacetic acid upon the point of a sterile tooth-pick. A single application of 25 per cent. argyrol

has also been effective. The tendency is to overtreat such nipples.

I have abandoned massage of the puerperal breast. I am quite sure that my patients' comfort has been enhanced and the subsidence of threatened inflammation brought about more safely and rapidly. The use of hot compresses has wholly supplanted the use of massage.

I have never found any drugs or so-called galactagogues of any possible service. I believe every woman is endowed with a certain amount of functional activity of the mammary glands and that we do better to direct our efforts to improve her general health, building it up to the highest level. With that we have done all we can do to help the defective breast.

In the administration of laxatives during the puerperal period, with the exception of salines, I find the infant little affected by any of the commonly employed laxatives. Cascara in nursing women has produced as little discomfort to the infant as any drug I have used. The routine application morning and evening of 50 per cent. alcohol and water on a compress laid on the nipple is the promptest way to recognize small fissures and as an efficient nipple cleanser. For these small fissures or sore nipples I use bismuth and castor oil with the addition of boric acid.

I believe in encouraging women to nurse their babies, but the moment the child begins to be restless, loses weight, cries when taken from the breast from hunger, and begins to fail in comfort and health it should be given artificial food in addition to the breast food. I can say nothing more important than the thought already expressed that if we bring artificial feeding of the infant to a higher plane of scientific accuracy, and the knowledge of the specialists becomes the knowledge of the general profession and of the mothers who are forced to artificial food, we shall have less infantile mortality.

DR. GEORGE M. BOYD.—The obstetrician, as Dr. Norris has stated, sees the baby in the maternity for about two weeks, and he follows the baby for probably about a month in the private cases, when it is referred to the family physician or the specialist. In my hospital work I find that almost all the babies nurse. In private work, however, there are some women who can nurse their infants but will not. There are a few who cannot. In the first place I think the obstetrician should do all in his power to persuade the mother to nurse her child; first, for her own good, and in the second place for his own convenience, for surely the mother who nurses her baby has a better getting up. The work begins during the pregnancy in the painstaking care. I have never seen much benefit from traction on the nipples or massage of the breast and anointing. Attention should be paid rather to the care of the patient during pregnancy and in bringing about a good getting up. In this way we can do much toward preparing the patient for lactation and its continuance. By the use of the



jacket bandage also we do not have the engorged breasts sometimes seen. The pressure of the bandage is increased if the supply is greater than the demand, and the patient purged and starved. We seldom resort to massage, our rule being "hands off." We should see that the patient has sufficient rest after her delivery. The recent suggestion from a German authority of getting the woman about in a few days seem to me unwise and harmful from the standpoint of lactation. The woman goes about with the uterus big and heavy with free bleeding or profuse lochia. She is thus drained and is consequently less capable of prolonged lactation.

I was glad to hear Dr. Hirst speak of the possibility of the reestablishment of lactation even after weeks of cessation. I think we are often too ready to place the infant upon artificial food of some character. In conclusion I would repeat my statement regarding the use of the obstetric bandage, and particularly the jacket bandage, thus controlling the mammary function in the first week of the puerperium and avoiding the various forms of infection which interfere with the nursing of the child.

DR. T. S. WESTCOTT.—I feel with Dr. Norris that a word of defense ought to be spoken for the American woman of the better class. In my experience I have found very few women who are not anxious to nurse their children and who, when this was impossible, did not keenly regret that they could not fulfil this duty. On the other hand, it is appalling how frequently a satisfactory breast supply is ruthlessly sacrificed at the hasty advice of the trained nurse. I am always interested, in a new case, in finding out why nursing was stopped and it is very frequently my experience to find that the trained nurse and not the physician had suggested the bottle. I think that this fact ought to be borne in mind in the teaching of nurses in our hospitals, where a word of warning should be given that it is no part of the duty of a nurse to interfere in the method of nourishing the infant. Much harm can be done by the trained nurse without the doctor's knowledge, and a great deal is done.

Dr. Griffith has wisely emphasized the point that we should not hasten to give up breast feeding for minor reasons. The mother will say that the milk does not agree with the child because it has pain or because it is not gaining as rapidly as she expects. This point of gaining weight is really one of the most important to consider in deciding upon the propriety of supplementing breast feeding. The weight chart of infants should be kept weekly and should be carefully studied by the physician. We know that a gain of from 8 to 12 ounces a week should be secured under the most favorable conditions of breast feeding. When a young infant gains only from 2 to 3 ounces a week, even though it is comfortable and apparently is digesting its food satisfactorily, we do not consider it for the best interests of the baby to rely entirely upon the mother's nourishment. I believe that under these conditions, after a fair trial of four or five weeks,

we should supplement the mother's feeding first by one bottle and gradually increase the number of bottles until the mother's milk naturally ceases. It may be a matter of one or two months before the last drop of mother's milk is given up, depending upon the progress of the infant and the continuance of the material supply. One or two bottles a day can very well be used in conjunction with the mother's milk without affecting to any distinct degree the output of the breast; but when three or four are needed and the stimulation of the mother's breast diminishes to that extent, the output of course diminishes rapidly.

It is advantageous in some cases to supplement an insufficient breast feeding by a partial feeding with the bottle. I believe this can be done with advantage in many cases where the mother's milk is good but is insufficient to satisfy the child, as shown by the baby's turning away in disgust after four or five minutes of nursing. We all know that infants are born with varying digestive capacities, dependent upon a number of different factors: heredity, development, or the condition of the mother's health during her pregnancy or near its end, such as poor nutrition, toxic conditions or eclampsia. The digestive power of every infant is measured by the percentage of each of the different elements of food which it can satisfactorily digest and appropriate. This may vary as any percentage formula varies. Some infants have a very low digestion for fat, whereas they can appropriate a larger amount of proteids than others. The infant whose digestive powers agree with the formula of the mother's milk is the one that thrives best upon it. The adjustment of equilibrium between the mother's milk and the child's digestion should always be awaited, and no haste be made to give up the baby's natural food until we are well satisfied that a change to artificial feeding should be made. The problem of feeding an infant artificially during the first few weeks of life is one of the most difficult with which we as pediatricists have to deal, and usually requires our ingenuity and resource. The important point is to avoid overfeeding. In the early weeks of life it is practically impossible to give with ordinary mixtures of milk a sufficient strength of proteid to supply the needs of the infant without at the same time passing beyond its digestion capacity for that element of food. During the first three or four weeks of life not more than 0.75 to 0.90 of 1 per cent. of the mixed proteids of cow's milk can be satisfactorily digested by the majority of infants, but this is insufficient for the needs of the infant at this time. In order to increase the proportion of proteids safely, nothing can so satisfactorily be added as lactalbumin which can be supplied by the addition of whey as part of the diluent. Such a mixture in proper proportions comes as near to an imitation of mother's milk as our present knowledge can supply, and offers an admirable food for the infant early deprived of its mother's breast.

DR. E. E. GRAHAM.—In a comparison of the infant mortality

of babies nursed by the mothers and fed artificially, the latter show practically all the deaths. Not only that, but we can go further. We can say that the children of the well-to-do if taken in the first few weeks of life and placed in charge of one who is more or less skilful in infant feeding show practically no mortality. Therefore we see that the infant mortality occurs among bottle babies and among the poor. This means that the whole problem is one of the education of the poor in the feeding of the baby on the bottle. The mother who is poor, who is able to nurse her baby, shows practically a very slight increase in mortality over the mother who has every comfort and is able to nurse her baby. Pediatricists do not dread the proteids as they did. I believe it is quite possible in the large majority of cases, when the child comes under our care in health, to feed a fairly high percentage of proteids without making any use of the whey proteid whatever. It is a difficult problem when the child comes under your care early in life as a sick baby. Then I think we are required to use all the ability we possess in order to save its life, but even here where the best nursing and care can be secured the mortality is almost a negligible quantity. The matter practically comes back to the education of the poor in the bottle feeding of infants.

I quite agree with those who have said that the mother in the better classes is willing to nurse her baby. My experience certainly agrees with that absolutely. Of course a great many are unable to nurse the child. Now I believe that more will be accomplished among this class by, in the majority of instances, allowing the baby to have a bottle a day from the earliest period of infancy. This gives the woman who has gone through a wearisome nine months of pregnancy and who is facing twelve months of lactation, an opportunity of now and then escaping the nursing. I believe that in the long run this does more good than harm.

One point brought out by Dr. Hirst is to me perhaps the most important mentioned tonight. In the last two or three years I have seen it work out practically very often. That is the ability of the women to begin the renursing of their infants. We all of us often have babies brought to us who have been weaned from one cause or another, with the child off the breast for from two to six weeks. In quite a fair proportion of these cases the milk can be brought back into the mother's breast. I believe the important facts are (I) that infant mortality is practically a question of the baby nursing its mother; (II) when this is impossible the education of the ignorant woman in preparing the bottle for her baby.

DR. ELEANOR C. JONES.—One point often lost sight of by the obstetrician in the care of the nursing mother, is in not directing that the baby be put to the breast sufficiently early after the confinement. In many cases brought to me I find that the baby has not been put to the breast for twelve or fourteen hours after

confinement. I believe this is a mistake, and that the baby should be put to the breast as soon as the mother has sufficiently rested, for otherwise the sucking instinct of the infant may be lost. It is important also to see that the mammary function is well established at the beginning of lactation. If the breasts do not fill up promptly, the patient should be given plenty of fluids, including milk and gruels, for if the mammary function is once well established, it is not nearly so likely to fail later. I find that most often the supply of breast milk begins to fail at about the sixth week. The baby is then taken to the family doctor and because he is not sufficiently urgent concerning the necessity of continuing the nursing, it is often put on the bottle without attempting to determine the difficulty with the breast milk. If the mother were encouraged to continue the nursing with perhaps one or two supplemental artificial feedings, I believe many babies would do much better. A very large proportion of all the sick babies are bottle fed. I cannot believe that it is merely a question of teaching the poorer classes how to feed the baby by artificial feeding. The whole matter is really a question of eugenics. It is a question of what is best for the race. We all believe that the race is best reared on maternal milk, consequently no social or economic considerations should be permitted to interfere with the exercise of this function. The physicians who are pediatricists must impress upon the other physicians the necessity of urging mothers to feed their babies on the breast.

From the standpoint of the prevention of infant mortality and disease, I think this is one of the most important meetings that the Pediatric Society has ever held. We must create the necessary sentiment in favor of breast feeding, for until this sentiment is created the average physician will continue quite ready, with the first intimation that the baby is not doing well, to suggest the bottle.

Regarding what has been said of the trained nurse; where does she get her training except from the physician? If she has been a "sinner" in advising bottle feeding there has been a sinner before her. She had been trained by the physician. As soon as physicians generally agree on the importance of mothers nursing their babies, the attitude of the nurse, which is after all only a reflex of that of the physician's will be that of her instructor's.

DR. MAURICE OSTHEIMER.—The Children's Aid Society has established a Directory for Wet Nurses and at present has eight babies in the homes of wet nurses, mothers who care for and nurse an extra baby. They hope in the future to be able to have a sufficient number of wet nurses to supply requests for them. The Society is making Wassermann and tuberculin tests of both nurses and infants, carrying on the work in a scientific manner.

DR. B. C. HIRST.—I would move that a conjoint committee be appointed of members of the Pediatric and Obstetrical Societies to confer with the bureau of registry of nurses in this institution

to arrange for a list of wet nurses to be kept here and be investigated by the physician who intends to employ them.

DR. CARPENTER offered the following amendment to Dr. Hirst's resolution: That it is the consensus of opinion of this joint meeting that we endorse the work done by the Children's Aid Society in establishing a Registration Bureau for Wet Nurses, and that the President of the Philadelphia Pediatric Society and the President of the Philadelphia Obstetrical Society appoint a committee to assist the Children's Aid Society in this undertaking.

DR. JONES.—I would like to suggest that in connection with this registry of wet nurses, that it be understood that mothers' milk can also be bought by the feeding, in order that a few ounces a day might be secured for a sick baby, in case it is impossible to secure the entire services of a wet nurse or when the cost of a wet nurse is prohibitive.

DR. EDWIN ROSENTHAL.—I would ask each one of the members to visit St. Vincent's Home and see how the method of having wet nurses works out in that institution. Whenever a baby is still-born the case is reported to the Home and the mother of the child is paid by the Home for her services, being provided with a baby at her home. The infant mortality has been brought down from ninety to ten per cent. or even less. The whole thing, however, will depend upon the family physician, for his cooperation is necessary to make this movement a success, but the result is mutually advantageous.

DR. J. P. CROZER GRIFFITH.—I can, perhaps, explain the exact origin of the wet-nurse project of the Children's Aid Society. The question arose through the difficulty encountered at the University Hospital, as every other hospital, in successfully feeding many of the children in the wards. The home surroundings of these were imperfect and it seemed desirable to place them in homes in the country, under careful, medical supervision, much after the manner of the work done by the Speedwell Society of New York. The question then arose whether it would not be possible to wet-nurse some of the babies urgently requiring this. As a result I met, on several occasions, delegates from the Social Service Committee at the University Hospital and the Children's Aid Society. The plan for placing babies in foster homes in the country districts is being matured. In addition, the desire is to find homes with women who would nurse babies from the hospitals together with their own babies. There will be medical supervision of the work to see that both children are properly fed. Both wet nurses and babies will be tested for the presence or absence of syphilis. In addition to this, it was thought that some of the expense of the care of placing children in homes in this way might be met by establishing a Directory for wet nurses for mothers of social position sufficient to enable them to have these in their own homes. There is at present no such Directory in Philadelphia. To make this a success, physicians must create



a sentiment for wet nursing, both among the richer classes, where the babies need them, and among the poorer women who are able to nurse children. When this is accomplished, the Directory will undoubtedly be a success, as it succeeded in New York City and in Boston. In the meantime, we, as physicians, should do everything in our power to encourage the work of the Children's Aid Society, both by referring those to them who need wet nurses, as well as those with milk to spare who can be persuaded to take such positions.

DR. M. H. FUSSELL.—I don't believe the trained nurse is responsible for the prevalence of bottle feeding but rather that it is due frequently to lack of interest of the doctors, to meddling neighbors and friends of the mother. In my experience the trained nurse, if any good at all, does everything in her power to continue the nursing. One of the greatest difficulties in my experience is that after the baby once tastes the bottle milk it is hard to continue the nursing. Therefore, I have put off supplemental feeding for that reason as long as possible. This question of the wet nurse is an extremely important one and I think it is better to have it in the hands of the Children's Aid Society.

THE PRESIDENT.—I think it might be well for us to embody in the motion, that a joint committee of the Obstetrical and Pediatric Societies be formed to help in any way in their power this work of the Children's Aid Society. By so doing we can educate the physicians who come to our meetings; help to increase the supply of the wet nurses, and also the demand for them.

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## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON PEDIATRICS

*Meeting, of November 7, 1912.*

*The Vice-President, L. EMMETT HOLT, M. D., in the Chair.*

#### THE PREVENTION OF TRACHOMA IN NEW YORK SCHOOL CHILDREN.

DR. ANNA W. WILLIAMS presented this paper in which she reviewed the work of the Health Department in dealing with trachoma in this city. The work of the Department of Health in combating this disease had been going on for about two years. When they began they found a great deal of vagueness in the literature in regard to the whole subject of trachoma. To-day the most that could be said for their knowledge was that their studies had opened up new and interesting aspects of the subject. A great deal of the confusion was due to the fact that no large series of cases had been under observation for a long period of time. Such a series they had started immediately, keeping



continuous charts by the folder system and they now had under observation in the neighborhood of 2000 cases. Among the interesting facts brought out were: 1. The finding of hemoglobinophilic bacilli and the trachoma inclusions coincidently so frequently in their papillary trachoma cases. 2. The morphological similarity between these bacilli and the trachoma inclusions. 3. The inability to differentiate these bacilli from those found in acute conjunctivitis and in many subacute borderline cases. These facts confirmed the old conclusion that acute contagious conjunctivitis was merely the first stage of the chronic condition of hyperplastic inflammation known as trachoma; that in chronic cases the bacilli were altered in virulence and the patient had from neglect or other causes acquired a hypersusceptibility to this altered virulence. They therefore decided to treat the acute cases more carefully as well as the trachoma cases and those called borderline cases. This they had proceeded to do as well as they could with their limited facilities. They devoted their attention to the lower East Side district where most of these cases were found. It was found that the children could be reached more directly through the schools and so they had enlisted the aid of the Board of Education. Two school clinics were started and mixed classes were formed for the selected cases. There were two classes, one for the smaller and one for the larger children. A nurse was constantly in attendance and the children were instructed both in general hygiene and in the hygiene of the eyes, nose and mouth. They were treated twice daily with the special drug needed and boric acid treatment was carried out at home. Talks on hygiene were also given to the mothers in a model flat loaned for the purpose. This instruction, they believed, was important as it was agreed that trachoma was a dirt disease occurring most frequently and intensely among the careless poor. By insistence upon personal hygiene, by treating more closely and by following up their cases of acute as well as of subacute conjunctivitis, they had obtained definite results which were shown by the charts presented. Many of the cases now considered cured might have to be changed later. The points brought out by the table were: 1. The large number of cases. 2. The relation of folliculosis to trachoma. 3. The relation of acute conjunctivitis to trachoma. 4. The number of cases cured. 5. The number of fresh cases of acute papillary conjunctivitis. They hoped that by continued observation they might have more exact knowledge next year.

#### DISCUSSION.

DR. STEWART L. CRAIG spoke of the importance of isolating these patients suffering from trachoma, a very difficult thing to do, however, in New York City. This was a condition that was a source of danger to every child. The classes that were now established were a step in the right direction.

## OBSERVATIONS ON THE CLINICAL USE OF IMMUNE AND NORMAL SERA.

DR. MATTHIAS NICOLL, JR., read this paper. He stated that interest in serum therapy had been stimulated by the addition to the force of the Research Laboratory and by the distribution of literature on the subject of serums and vaccines, by consultations written or verbal with hospital and outside physicians, and by standing ready to personally administer specific treatment when requested to do so. With the object of increasing their knowledge of the value of such sera, these had been supplied freely to all physicians of this city demanding them, on the sole condition that they should forward to the department at the termination of the case, a short clinical history, the result of blood cultures, or cultures from lesions, the effect of the serum, on the pulse, temperature and general course of the disease, together with such other data as were likely to be helpful in determining its value. Such records were not for publication except by permission of the physician. This plan had been but moderately successful as probably not more than one-tenth of the physicians and institutions supplied with the serum had responded to the request for information, notwithstanding numerous repetitions of the request. They had, however, been permitted to visit and observe personally cases in hospitals and this would undoubtedly be the best means of determining the value of the various preparations were it possible to make these visits with their limited force. Series of cases had been treated by some of the laboratory workers in their own hospital services and by these methods a certain amount of information had been accumulated. There could be no doubt that the huge dose of 100 to 200 c.c. which was generally regarded as necessary to produce results with the immune sera had militated largely against its more general use. When such a dose was used subcutaneously some such apparatus as Dr. Nicoll exhibited was almost essential and was not readily obtainable. An intravenous administration required a certain amount of practice and was unquestionably looked upon with more or less dread by the average physician. Until some means was discovered of concentrating the active principle, it was difficult to see how such difficulties could be overcome and the sera would be used as now, only in such cases as were regarded as desperate. The pneumococcus serum had been kept in stock for a short time only and during that time there were few cases of pneumonia; the results obtained in the few cases in which it had been used were not sufficiently marked to enable one to draw any very definite conclusions as to its value. In some instances it seemed to have shortened the course of the disease and caused a drop in the temperature; in others no apparent effect was produced. It had usually been used intravenously in doses of 100 c.c. It was truly polyvalent, the horses being immunized with a dozen or more strains, first of pneumococci

killed by heat, later autolysates, and finally living virulent pneumococci.

Antistreptococcus serum as at present supplied was also a polyvalent preparation obtained from horses highly immunized against killed streptococci, autolysates and living streptococci. These included a dozen or more strains obtained from cases of scarlet fever, of puerperal sepsis, empyema, erysipelas, etc. A special serum for use in endocarditis was also made.

Owing to the difficulty of obtaining the antistreptococcic serum, it had been but little used in this country, and our knowledge of it came largely from German and Russian sources. They were now getting records from the Research Laboratory and its use in this city was increasing rapidly.

Thus far it had perhaps proved most useful in scarlet fever. Abroad it had been given in this disease as a routine measure and at an early stage of the disease. With the lowered mortality in this country such a proceeding would not be justifiable, and its use had been largely limited to the so-called septic cases. For this reason it was impossible to compare the results here with those obtained by foreign authorities. Dr. Nicoll presented charts which represented a series of cases treated at the Willard Parker Hospital. All the patients had been ill from two to eight days. The dosage used was smaller than would be considered advisable to-day. In addition to the effect on the pulse and temperature, it was noticeable that the discharges from the nose and mouth very rapidly subsided together with the swelling of the lymphatic glands about the neck.

Dr. Nicoll said that the case which he wished to report had been given him by Dr. Cole of Rockefeller Institute. The patient was admitted to the Rockefeller Institute on the third day of her disease, with tonsils much swollen on one side and covered with necrotic-looking membrane. The nasopharynx was markedly involved, the left ear drum red, the anterior cervical lymph nodes greatly enlarged. There was an intense general scarletiform eruption over the body, petechial in character. The next day the patient was irrational and on the following day still worse. The throat condition was worse, the heart rapid, its sounds muffled, presystolic gallop rhythm and the blood contained streptococci. After the administration of the serum the temperature fell five degrees in two hours and was practically normal the day after.

In puerperal sepsis the subcutaneous or intravenous use of the serum left much to be desired. A number of cases were much benefited, and a much larger number were not influenced. It must be said, however, that a number of the patients were *in extremis* when the treatment was undertaken.

In erysipelas in a number of instances the temperature had fallen by rapid crisis following the use of the serum, and the skin lesion subsided within two or three days. In other cases the effect of the serum was not distinctly marked.

The value of the serum locally as a packing for discharging wounds, cellulitis, etc., was not sufficiently appreciated. Under its use, sluggish granulations rapidly became active, the discharge ceased, and the wounds healed with great rapidity. As a local application to throats, especially in scarlet fever, it was extremely valuable. It should be applied freely every two hours. As a packing for an infected uterus it had proved very valuable. Gauze saturated with it was left in place for twenty-four hours, and then renewed.

Normal horse serum had proved of decided value in subcutaneous doses of 10 to 20 c.c., repeated if necessary, in intestinal hemorrhage, notably that of typhoid fever, epistaxis, stubborn purpura hemorrhagica, and to a certain extent in hemoptysis, and ulcer of the stomach. It had proved of less value in hemorrhage of the newly born, and it seemed that in this condition, direct transfusion or the use of human serum was preferable. The serum had been used, principally in England, as an application to chronic ulcers with excellent results.

The bad results that might follow the use of the serum were rashes, usually urticarial in character. They might be accompanied by a moderate rise in temperature, and occasionally joint pains. Chills occasionally followed an intravenous injection of a large amount of serum, and in one case Dr. Nicoll had seen delirium. None of these symptoms, however, had lasted more than a short time.

In regard to anaphylaxis the essayist said this was a bugaboo to the clinician for which the laboratory was largely responsible. This was a phenomenon which could be readily produced experimentally in certain of the lower animals by properly spacing the administration of a foreign proteid, and with fatal results. In the human being, fortunately, this rarely occurred. He had seen true anaphylactic shock but once and that as in an almost moribund child. In the case of very asthmatic individuals and those with a marked lymphatic diathesis, the use of sera should, if possible, be avoided.

#### THE DIFFERENTIAL DIAGNOSIS AND TREATMENT OF EPIDEMIC CEREBROSPINAL MENINGITIS.

DR. PHEBE L. DUBOIS read this paper. She recalled that in 1906 the New York Board of Health had supplied anti-meningitis serum for use subcutaneously in cases of epidemic cerebrospinal meningitis but that it was found to be of slight avail and its preparation had been discontinued. After its value had been proved when administered intraspinaly the Rockefeller Institute gave the Health Department two horses immunized against the meningococcus and a generous supply of antimeningitis serum. Since that time the Health Department had prepared it and offered the services of a consultant to every physician reporting a case of meningitis not in a hospital. In this way they had seen 247 cases, at least half of which were re-

ported as epidemic cerebrospinal meningitis and the remainder as meningitis, kind not designated, or as tuberculous meningitis. The essayist then showed a table of final diagnoses which made it evident that there was a large percentage of errors in diagnosis and that there were few cases of cerebrospinal meningitis in New York.

The streptococcus, pneumococcus and influenzal cases could not have been differentiated except by lumbar puncture, though the history of middle ear disease, injuries of the skull, operations on the nose, etc., often made them suspicious. The cases of infantile paralysis that they had seen had been of the encephalitic rather than the myelitic type. In the cases of pneumonia, gastroenteritis, hysteria, simple neurosis, acidosis, typhoid fever, osteomyelitis, and serous meningitis, the rigidity of the neck, and in some cases a Kernig's sign was probably what caused the physician to report the case as meningitis. The meningismus coming early, before there were any signs of pneumonia, was the most difficult of all these conditions to distinguish from true meningitis. Cases of epidemic cerebrospinal meningitis and infantile paralysis usually gave a history of a sudden onset as against a slower onset in tuberculous meningitis. The patient's mental condition was usually good in meningococcic meningitis unless it was a fulminating case. In tuberculous meningitis there was often a history of irritability, followed by increasing stupor from which it was often impossible to arouse the child. In infantile paralysis the patient was frequently apparently stuporous but he could be aroused and made to answer intelligently. Cases of epidemic meningitis showed marked rigidity of the neck; tuberculous cases were apt to have slight or moderate anterior posterior rigidity but none laterally. In infants the rigidity of epidemic cerebrospinal meningitis was so easily overcome as to make one doubt its existence, but when the child was turned on its side, the head was markedly retracted. They had found Brudenski's and MacEwen's signs much more useful than Kernig's. Brudinski's sign consisted in the flexion and eversion of the legs and arms when an attempt was made to flex the head on the chest and the drawing up of one leg when the other was passively flexed. MacEwen's sign was a change from the normal in the percussion note over the lateral ventricles due to increased intraventricular pressure. The fever was higher in infantile paralysis and epidemic cerebrospinal meningitis than in the tuberculous form. In cerebrospinal meningitis it ran an irregular course, while in infantile paralysis it usually only stayed up a short time and fell by lysis. Paralyzes were not common in meningococcic meningitis, were often present one day and gone the next in tuberculous meningitis, and usually improved slowly in infantile paralysis. Convulsions occurred in all three conditions. Projectile vomiting was not uncommon in tuberculous meningitis. While these were the main points of differentiation between these three conditions they could not always be certain



of them clinically; the surest means of diagnosis was by examination of the spinal fluid and that was not always certain. Cerebrospinal meningitis nearly always gave a cloudy fluid while infantile paralysis and tuberculous meningitis gave a clear fluid under increased pressure. At the Babies' Hospital Dr. Hemingway has made a record in finding tubercle bacilli in cerebrospinal fluids, but there repeated punctures were made and sometimes a search of several hours was necessary. They rarely made more than one puncture and rarely spent more than an hour in searching. They usually trusted to guinea-pig inoculation for the final diagnosis when they did not find the bacilli. In considering the treatment of epidemic cerebrospinal meningitis, Dr. DuBois divided the subject into prophylactic, specific, and general. The prophylactic consisted in quarantining the case and looking for carriers. They now made cultures from the throats of those coming in contact with the patient, but had not yet had sufficient experience in ridding carriers of their meningococci to know what was the best means, but they hoped to find out this winter. Dr. Sophian found that the injection of antimeningococcic vaccine was effective. Hachtel and Hayward in Baltimore had used a spray of antimeningococcic serum effectively. In some experiments made at the Research Laboratory of the Board of Health they had found that of the usual disinfectant used in the throat, argyrol in 15 to 20 per cent. strength was the most effective in killing meningococci *in vitro*. The specific treatment consisted in the intraspinal injection of antimeningitis serum. They always injected the serum if they found a cloudy serum on puncture. They usually injected a quantity of serum a little less than the amount of cerebrospinal fluid withdrawn. Using changes in blood pressure as a guide to the dose as suggested by Dr. Sophian, was probably a good thing especially for those who had had little experience in administering the serum. In an ordinarily severe case they did a lumbar puncture, drew off all the fluid they could and injected serum every day for four days. Further injections depended upon whether the fluid was sterile or not, and upon the patient's temperature and general condition. The rigidity of the neck was usually late in disappearing and if the patient was improving in every other way that did not disturb them. Dry taps occurred now and then without disturbance of the communication between the meninges of the brain and cord. They had used an autogenous vaccine in two cases that threatened to become chronic but could not say whether or not it had helped until they had tried it longer. Cases that developed basic meningitis where the communication between the meninges of the brain and cord was cut off had never recovered in their experience. For general treatment they recommended the administration of urotropin because experiment had shown that after its use formalin was found in the cerebrospinal fluid. They advised the use of sedatives where the patient was restless. The diet should not be too limited since the dura-



tion of the disease might be prolonged. The bladder should be watched as many cases developed retention of urine. Meningococci were sometimes found in the urine and this should be remembered in ordering the hygiene of the sick room. Before using the serum, the mortality averaged 75 per cent.; their mortality since using the serum had averaged 50 per cent. Several of their cases they did not see until late in the disease and many were receiving poor care so far as nursing was concerned. Dr. Sophian in his experience in Texas had a mortality of 28 per cent. in the hospital. The prognosis was better for children than for adults.

DR. L. EMMETT HOLT reported an interesting case in which there followed a very discouraging result following the action of the injection of the serum. The baby was seven months old and after the third injection stopped breathing for many minutes; artificial respiration had to be resorted to before the baby could again breathe naturally. He said he had seen a similar case in the hospital two years ago; two injections of the serum were given. Immediately following the second injection of 25 c.c. and when they started to withdraw 45 c.c., the patient went into a condition of collapse and it took nearly twenty minutes before the patient could be resuscitated.

DR. DuBois said that she had had six or eight cases of that kind.

#### THE DOSAGE OF DIPHTHERIA AND TETANUS ANTITOXIN AS DETERMINED BY ANIMAL EXPERIMENTATION.

DR. Wm. H. PARK said that in Boston they were in the habit of giving large doses of diphtheria antitoxin while in Philadelphia they gave about one-half the amount given in Boston, whereas abroad they gave about one-tenth. It seemed to him that if animal experimentation was resorted to they might have derived some help. Therefore at the laboratory Dr. George Patten Biggs had made a series of experiments. It should be remembered that the toxins were elaborated in the tissues involved and that a certain quantity was used up in attacking the cells and a certain quantity got into the lymph and blood. A smaller quantity went through the capillaries. This liquid in passing through in the body fluids poisoned the general cells which were almost beyond reach. The question arose, how much poison was there? They tested the blood of patients coming to the hospital before they were injected. It was safe to say that no patient had more than ten times the amount of toxin, or enough to kill ten guinea-pigs. How did the antitoxin gain access to the toxin? It must pass through the tissues, through the lymph, through the capillaries. What Dr. Park was speaking of was the determination of the dose by clinical observation, and the location and amount of toxin in a case of diphtheria, and the amount of antitoxin required to neutralize the total possible toxin. How was this contact obtained? Access must be in the blood-tissue fluids. Charts

were presented which showed the comparative amount of antitoxin in the blood at one, six and twenty-four hours when 10,000 units were given subcutaneously and intravenously. The time element was a very important factor and two charts he presented were very interesting in bringing out the point that the subcutaneous injection was a very slow method of getting the antitoxin into the blood and general tissues. The antitoxin should be administered intravenously. One should not start out with the idea that in these cases two, three or four doses of antitoxin were necessary; a single dose should be all that was necessary. The subcutaneous method should be sufficient in the mild and moderate cases giving from 5000 to 10,000 units. The intravenous injection of 10,000 units should be employed in the advanced and malignant cases. When small amounts of antitoxin were given the patients would be saved if it was given early in the disease. If given late the chances were that the patient could not be saved by these small doses. In the very severe cases one must give large doses of the antitoxin intravenously for the purpose of hurrying it into the tissues. Do not delay for this time element was a very important factor, not only in diphtheria but in tetanus. In tetanus the antitoxin should always be given intravenously, cutting down upon the vein for this work. Large doses should be given such as 20,000 units and repeated if necessary.

#### THE CLINICAL USE OF A DUODENAL CATHETER IN INFANTS.

DR. HESS described the clinical and experimental use upon infants of a simple duodenal catheter. This instrument is merely an ordinary Nélaton catheter with some slight variations. The difference between this tube and the one used for adults is that by its means, he is able to reach the upper intestine in a few minutes, and does not need to depend upon peristalsis. In other words, it is an active and not a passive method.

The pictures which he threw on the screen showed the catheter in the duodenum and, peculiarly enough in every case, demonstrated that its course was not a vertical one, but that it made a sharp bend to the left of the fundus of the stomach, and, furthermore, that the stomach of the infant is not vertical, as generally supposed, but lies horizontally.

This catheter can be used in diagnosis in differentiating spasm from stenosis and in therapeutics, for in cases of persistent vomiting, its passage through the pylorus seems to relieve this spasm, and in the second place, food may be allowed to flow directly through it into the intestinal canal. In these ways, it would seem to offer new prospects in cases of severe vomiting in infants.

From a purely experimental or scientific point of view, with this instrument Dr. Hess was able for the first time to make direct tests of the pancreatic ferments in infants, and stated that he had found that in cases of marasmus these ferments are not appreciably lacking, and therefore it is a mistake to attribute malnutrition to a disorder of this gland.

## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN.

**Effect of Pasteurization of Milk on Babies.**—In an effort to elucidate this problem, J. L. Morse (*Boston Med. and Surg. Jour.*, 1912, clxvii, 510) addressed a series of questions to the members of the American Pediatric Society of whom fifty replied. The conclusions drawn are extremely general and quite unsatisfactory. The writer says it is impossible to determine from the evidence at present available whether or not babies fed continuously on pasteurized milk thrive as well as those fed on raw milk of whether or not the continuous use of pasteurized milk predisposes to the development of the diseases of nutrition. There is sufficient evidence to show, however, that if the continuous use of pasteurized milk is injurious to babies, its possibilities for harm are much less than those of bacteria. All but the cleanest milk should, therefore, be pasteurized before it is given to infants. There is, on the other hand, sufficient doubt as to the innocuousness of pasteurized milk to justify the avoidance of pasteurization whenever the character of the milk warrants it.

**Treatment of Diphtheria.**—G. Leary (*Australian Med. Jour.*, Sept. 21, 1912) advocates the use of large doses of antitoxin in diphtheria. He says that in all severe nasopharyngeal cases, 50,000 units should be the initial dose. If the case is complicated with swollen glands, spreading membrane, signs of rapid and marked toxemia, 75,000 to 100,000 units, should be administered as soon as possible. In infants with croup, or children with croup and faucial or nasal diphtheria the dose should be regulated never in accordance with age or by stamina (except specific), temperature or pulse, but by the number of days of invasion: If of forty-eight hours' duration 24,000 units at once; if complicated, or over three days, 30,000 to 80,000 units. In uncomplicated cases of two or three days standing 8000 to 12,000 units should suffice, carefully noting general condition and state of membrane.

**Books as Carriers of Scarlet Fever.**—An investigation of this subject has been carried out at Valparaiso, Ind., a place with a population of about 10,000, this investigation being directed to the public city library only. The conclusions reached by O. R. Nesbit (*Jour. A. M. A.* 1912, lix, 1526) are that if books act as carriers, it is only immediately after being contaminated with the discharges of the patient; yet this investigation has failed to reveal a single instance of this kind. Books that have been used by scarlet fever patients do not long contain the infection in such a way as to transmit the disease to man. Any book which has been

handled by a scarlet fever patient should be burned or fumigated. The most practical method for general book disinfection at this time is the Beebee carbogasoline method. This consists in using gas-machine gasoline and 2 per cent. phenol crystals; the books are immersed in this mixture for twenty minutes, removed and placed before an electric fan for two minutes, and then set on end for from twenty-four to forty-eight hours.

**Influence of High Protein Feeding on the General Metabolism, Intestinal Flora and Temperature of Infants.**—In this series of five observations upon three infants by L. E. Holland P. A. Levene (*Amer. Jour. Dis. Child.*, 1912, iv, 265) with clinical observations by A. Brown, bacteriological by M. Wollstein, and metabolic by A. M. Courtney and J. A. Moore, a "synthetic" food was employed. In order to secure a diet containing the maximum part of the calorific requirement in form of protein, milk had to be avoided as the solvent of the casein, as such a mixture generally gave too high a calorific value to the food. The casein was therefore dissolved with the addition of a solution of sodium hydrate; the final mixture being, however, rather on the acid than on the alkaline side. The following facts were noted by the various observers. Alimentary fever may under certain conditions occur in infants after administration of casein of cow's milk and perhaps of other proteins. The rise of the body temperature was observed only when the food mixture was made up so as to contain about 6 per cent. of protein (chiefly casein) and a minimal quantity, only about 150 to 175 c.c. of milk daily. The rise of body temperature was invariably accompanied by a retention of chlorids, which, however, usually preceded the febrile attack by two or three days. After the first rise of temperature the fever persisted so long as the diet was continued, but in every instance promptly disappeared as soon as the food was changed. For this reason and since the bacterial conditions of the intestines noted during the period of the "synthetic" food were not different from those noted during the preceding period, the fever is apparently due to the direct action of the absorbed protein. It would appear that the changes in the food influenced the chemistry of the excreta more than they did the bacteriology. For while the chemical changes resulting from the food variations differed considerably in the individual cases, the bacteriology changed along the same general lines in all. In view of this fact and of the slow changes in the intestinal flora, such changes would seem to have but a limited application for therapeutic purposes, though a very definite one when the food changes can be made sufficiently great. It seems clear from these observations that one may use considerably higher percentages of protein in milk formulas than the 3.5 per cent. of Finkelstein's formula. This is a point which may be of much practical importance in conditions in which there is marked intolerance both of fats and carbohydrates. Such high proteins as 4.5 per cent. or over should be used only for limited periods, and never given at all except with a suitable proportion

of whey. This report emphasizes the physiologic importance of whey in the nutrition of infants and other young animals. While laying stress on the dangers of whey, especially from its sugar content, in many forms of intestinal disturbance, Finkelstein and Meyer have also appreciated the dangers to nutrition which may follow reduction of the salts. Recently Osborne and Mendel also have found that the mineral salts in the proportion present in whey were absolutely essential for the growth of animals, and that in the absence of salts, though maintenance of life was possible, growth could not be induced. As yet it is not possible to formulate any definite opinion as to the nature of the whey components which inhibit that action of casein, which, in the absence of whey, causes the rise of body temperature. The present observations call special attention to the work of Vaughan and his collaborators, who have repeatedly reported the production of fever by the subcutaneous injection of various proteins.

**Salicylates in the Treatment of Acute Chorea.**—N. K. Fromm (*Albany Med. Ann.*, 1912, xxxiii, 636) emphasizes the generally recognized intimate relation of chorea to rheumatism. The writer believes that enlargement of the thyroid, as pointed out by Clemens, should be considered as another link in the chain of rheumatic manifestations. The salicylates are practically specific in acute rheumatism—it would seem that we can conservatively say that they are at least useful, in the majority of choreic cases. While chorea is said by many to be a self-limited disease, the writer claims that salicylic acid shortens its course, and renders the ravages of the frequently accompanying endocarditis less severe.

**Acute Anterior Poliomyelitis.**—W. H. Trethowan (*Lancet*, Oct. 5, 1912) reviews the recent investigations of this disease in Sweden. These show that districts which have once been severely affected have all prospects of escaping another severe outbreak, even though many years may have elapsed. The exemption of the old centers during subsequent epidemic is explained on the supposition of the existence of a widespread acquired immunity within these centers; in other words, that almost the entire population in the district is immune. Experimental investigations establish the extreme prevalence of abortive cases and healthy persons who carry the infection, and make it certain that such carriers are, at the very lowest estimate, four or five times as numerous as cases showing definite paralyses. It follows from this that natural susceptibility to epidemic poliomyelitis must be small.

**Common Varieties of Tonsils.**—Examination of 200 tonsils by F. C. Pybus (*Practitioner*, 1912, lxxxix, 609) shows that the tonsil is normally an embedded structure. There is a common type of hypertrophy in which part of the tonsil projects beyond the faucial pillars. The embedded tonsil comes next in order of frequency. In 90 per cent. of all cases more tonsil is hidden than is visible. In only about 7 per cent. does more tonsil



project than remains hidden. In nearly all cases in which tonsillotomy is performed, although a large projecting piece of tonsil is removed, a considerable portion is left behind, which may continue to grow. Of greater importance is the fact that it is this remaining portion of the tonsil which is most frequently diseased, and so the really septic portion is left behind. This remainder frequently causes sore throats, peritonsillar abscess, infection of the cervical lymphatic glands, and not infrequently demands subsequent removal. Further, many tonsils, which appear natural on inspection of the throat, show on removal purulent or caseous foci deep in their substance, and usually the small tonsils are the worst offenders in this respect.

**Inunction Treatment of Measles.**—D. I. Connolly (*Practitioner*, 1912, lxxxix, 644) says that the general trend of opinion among the medical profession toward the use of eucalyptus inunctions in the treatment of infectious diseases, chiefly scarlet fever and measles, may be said to be of a noncommittal character. He has employed this method in 160 cases. He believes that the thorough rubbing in of eucalyptus oil all over the body, together with energetic local antiseptic applications to the mouth and fauces, are most useful adjuncts in the treatment of measles. The mouth is irrigated twice daily with weak alum lotion, and glycerin and borax are applied to the interior of the mouth and to the gums. The throat (tonsils and fauces) is swabbed with carbolic oil (1-10) morning and evening. The case-mortality is decidedly lowered, and even when serious complications are present, the treatment has a beneficial influence on the course of the disease. Careful and constant nursing and maintaining of an even temperature of 65° F. are very important.

The beneficial effect of the treatment is brought about, in the main, by the inhalation of the vapor of the eucalyptus, and the local applications to the mouth and fauces of antiseptics.

**The Etiological Relationship of the Bordet-Gengou bacillus to pertussis** is the subject of research by Inaba (*Zeitsch. f. Kinderhk.*, 1912, iv, 152). He was able to demonstrate the organisms by smears in seventy-eight of eighty-one cases of clinical whooping cough. The three negative cases were advanced ones, the patients being out of the convulsive stage. Cultures were made in seventy-seven cases and the organisms were found in sixty-eight. In eighteen cases of various forms of respiratory disease other than pertussis it was impossible to find the Bordet-Gengou bacillus. Inaba tried to transmit pertussis to dogs by the application of cultures of the bacillus to the throat. The results were entirely negative. By application of the bacilli to the throat of a monkey (*Macacus speciosus*) a typical paroxysmal cough accompanied by vomiting occurred.

**The Significance, Frequency and Therapy of Transitory Fever (the so-called Inanition Fever) in the Newborn** has been considered by v. Reuss (*Zeitsch. f. Kinderhk.*, 1912, iv, 32). The author believes that the rise of temperature often seen during the first week



of life is in causal relationship to the pronounced physiological changes which take place at this time. The important factors are the substitution of the meconium bacterial flora by that dependent on the presence of milk in the intestinal canal; the irritative influence of bacterial products or toxins as well as the food and its split products on the organism as a whole. Of importance also is the presence of products due to the tissue destruction which takes place at this time, the influence of the small fluid intake and the concentration of the tissue juices and lastly, the influence of the heat regulating apparatus. He does not believe that such temperatures are due to inanition and concludes that a rise of temperature in the middle of the first week, usually on the third or fourth day is not uncommon. The temperature may fall suddenly after a few hours or after two to three days and usually falls by crisis. When the fever is short there are no disturbances in the general condition, when of longer duration the infant is restless or languid and somnolent. As a rule there are no objective findings but in one case there was a slight enlargement of the spleen. The therapy is entirely symptomatic—cold sponges or packs when necessary. The food should be the same as for infants without fever.

**Functional Disturbances of the Vascular and Lymphatic Systems of the Skin as the Result of Scarlet Fever.**—Oskar Kirsch (*Zeitsch. f. Kinderhk.*, 1912, iv, 97) concludes that at the height of the scarletinal rash there is a marked degree of inflammatory dilatation of the arterial capillaries of the skin and presumably also of the venous and lymphatic vessels through which the contractility of these vessels is much disturbed. He believes that the marked pallor of the skin in convalescence is not alone due to a true anemia but also to a contraction of the arterial vascular network of the skin. The highest grade of functional disturbance in the skin vascular apparatus occurs in nephritis. Here the occurrence of edema is associated with contraction of the lymphatic vessels. These vascular disturbances are due to an anatomic injury to the vascular musculature.

**The Iron Content of Goat's Milk** has been determined by McLean (*Zeitsch. f. Kindrehk.*, 1912, iv, 168) by the method of Edelstein and Comka. The quantity of iron per 1000 c.c. ranged from 127 to 263 milligrams. These results show that the iron content of goat's milk is greater than that of cows' milk and is approximate to the quantity contained in human milk.

**Metabolism in Congenital Obliteration of the Bile Ducts.**—Nieman (*Zeitsch. f. Kinderhk.*, 1912, iv, 151) reports metabolism experiments on a case of congenital obliteration of the bile ducts. The infant lived nine months and died as the result of bronchopneumonia. The investigation was divided into three periods. The first was when the infant was twenty weeks old during which there was a gain in weight of 55 gm. The second was during the twenty-fifth week after the infant had recovered from bronchopneumonia and the weight was stationary for some

time. During this period there was a gain of 75 gm. The third period was in the thirty-third week, three weeks before death. Edema had appeared so that the gain of 270 gm. was perhaps due to this cause. The lungs were affected at this time and there was fever. The food during all three periods consisted of buttermilk with the usual addition of 15 gm. of flour and 50 gm. of cane sugar per liter. As would be expected from the pathological condition, the utilization of fat was very poor. During the first two periods 61 and 72 per cent. respectively of the ingested fat escaped in the stools. During the third period more fat was excreted than was ingested. These results show that the presence of bile in the intestinal canal is as essential for the absorption of fat in infancy as in adult life. During all three periods the splitting up of the fat was good. The greater quantity of the excreted fat consisted of fatty acids and to a lesser degree of soaps. The presence of bile in the intestines is not necessary, therefore, for the fats to be split up. The utilization of nitrogen was fair in the first two periods, but very poor in the third during which there was a nitrogen deficit. The carbon balance was determined only for the last two periods. In the second period there was a retention of 79 C. for the three days. In the third period there was a great carbon loss.

**The Hypodermic Use of Hematinics.**—Lowenbmg (*Amer. Jour. Diseases of Children*, September, 1912) reports the results of this method in the treatment of anemia in children, for which he uses a solution containing citrate of iron ( $3/10$  or  $3/4$  grain), cacodylate of soda ( $1/2$  grain), glycerophosphate of soda ( $1\ 1/2$  grains), dissolved in 20 minims of distilled water. This solution is nonirritating if injected deeply and the most favorable site for the same was found to be the postero-lateral inner aspect of the upper portion of the arm. The author's report includes twenty cases in which 202 injections were given, averaging about ten each. With three exceptions the patients were rapidly benefited by the treatment and the writer concludes that in the hypodermic injection of hematinics we possess a quick, safe, and reliable method for treating the anemias of childhood. The combination of iron and arsenic compounds seems to have a better effect than either alone. Small doses of each give as good results as large ones and the tonic effect is noted almost immediately after beginning treatment.

**A Case of Spurious Meningocele.**—Schindler (*Jahrbuch f. Kinderheilkunde*, Bd. xxvii, H. 2) reports from Finkelstein's Clinic in Berlin an interesting case of traumatic meningocele combined with a pachymeningitis, in which it was possible to obtain an autopsy. The child was thirteen months of age and developed a parietal tumor after having been struck with a ball in this region. A diagnosis was made of spurious traumatic meningocele with hemorrhagic contents. Lumbar puncture was done several times and the child seemed to improve as the fluid in the tumor subsided. Subsequent to an attack of

grip the child died and a very complete autopsy showed the presence of a tuberculous infection of the lungs and bronchial glands together with a general miliary process including the meninges. There was present an extensive thrombosis of the cerebral veins and sinuses with large hemorrhages into the ventricles. There was an opening in one of the temporal bones which also involved the meninges. The writer believes that the meningocele was brought about by the intracranial pressure due to the pachymeningitis and that the opening in the bone was due to absorption following pressure atrophy. Lumbar puncture in this case not only aided the diagnosis but seemed to have a favorable effect on the condition and its adoption for this purpose is therefore recommended by the author.

**Juvenile Parasyphilitic Affections.**—G. W. Howland (*Univ. Toronto Med. Bull.*, 1912, i, 17) says that in juvenile tabes, optic atrophy and diminished vision with usually a diminished field are among the most common signs and are usually not attended by ataxia. The Romberg sign is fairly common; the Argyll-Robertson pupils are almost universal, frequently unilateral at first and usually accompanied by irregularity in the size of the pupillary aperture. Cranial nerve symptoms are on the whole rare, although a few cases show some degree of ptosis and also an internal muscle weakness, but the presence of these particularly in association with cephalalgia and presence of knee-jerks unquestionably mark the case as one of cerebral syphilis and not of a parasyphilitic type. Cephalalgia is reported in a few of the cases, but always suggests the preceding diagnosis or complication, and particularly when the pain is not of trigeminal origin. Shooting pains in the legs frequently occur. Sensation is rarely markedly affected, and mainly in some slight degree of hyperesthesia, or hyperalgesia, or some moderate, very moderate form of anesthesia. Motion is commonly disordered and the patient complains of a feeling of weakness in the limbs. The bladder is also early affected, and frequently the trouble arises as nocturnal incontinence, followed later by trouble by day. Gastric crises are exceedingly rare, if ever present. Vomiting points to cerebral syphilis, not to tabes in the juvenile type. The reflexes are either abolished or markedly diminished and this implication is an early symptom, so that one may conclude that the main signs are absent reflexes, shooting pains, Argyll-Robertson pupils, and diminution in vision. Mental signs are not common, frequently there is diminished mental activity with the onset of the disease, but these signs carry the disease over from pure tabes to tabo-paralysis and general paralysis itself. A number of cases examined have shown a polylymphocytosis of the spinal fluid and Wassermann reaction has been found positive. The course of the disease is slow. Juvenile general paralysis is a parasyphilitic affection which appears at about the age of nine years or later. The writer records a typical case of a girl of thirteen years, both of whose parents gave a distinct

history of syphilis. The child was apparently healthy and developed mentally until eight years of age. Then a gradual degeneration of mental activity occurred, characterized by a limitation of all psychical action in every direction, causing a distinct change in the actions of the individual, and making the thoughts short in direction and passage from one to another rapid. To this mental condition were added early attacks of mild convulsions, a slight hemiplegic attack and high tonus in the reflexes with absence of eye reactions, and presence of tremors and twitching, and finally with a positive cell count of seventeen mononuclears per cubic millimeter of spinal fluid and a positive Wassermann reaction.

**Syphilis of the Nervous System in Infancy, Childhood and Early Adult Life.**—S. A. Owen (*Clin. Jour.*, 1912, xli, 17, 42, 75) states that syphilis produces lesions of the nervous system in young subjects with far greater frequency than is generally supposed. While it is more usual to meet with lesions of the nervous system due to inherited syphilis, we must not lose sight of the fact that in a small percentage acquired syphilis is responsible. The nervous lesions in acquired syphilis may occur very soon after the primary infection. In inherited lues, while most of the nervous lesions first manifest themselves within the first few months or even years, they may occur at any age up to puberty, at which time the para-syphilitic diseases are usually met with for the first time. If we admit that a Wassermann reaction of the blood when positive (with well-defined exceptions), is conclusive evidence of syphilis, past or present, then we have in this reaction a very valuable method of examination, because a positive Wassermann reaction of the blood may be the only positive evidence we have of syphilis. A careful chemical and cytological examination of the cerebrospinal fluid, especially with the application of a Wassermann reaction to this medium, is essential. It will, in a large percentage of cases, enable us to differentiate syphilis of the nervous system which is amenable to treatment from para-syphilis. Where syphilis appears to produce a primary neuronic decay or dystrophic condition in the nerve structures apart from any pronounced meningeal changes, we must not expect to find changes in the cerebrospinal fluid that we usually associate with syphilis and para-syphilis of the nervous system. While the evidence is rather conflicting, it would appear that syphilis is responsible for a higher percentage of simple mental defect than is usually stated. While syphilis is responsible for a high percentage of cases of interstitial keratitis it is the only cause of hyalitis in infants, a rare but well-recognized type of amaurosis in infancy. During the first few months of life syphilis is a not infrequent cause of meningitis and hydrocephalus. A lumbar puncture and a Wassermann reaction afford great assistance in the differential diagnosis. The part which syphilis plays in the production of diplegia is uncertain. The writer thinks there is

evidence to show it is responsible in a few cases, more especially of the antenatal type. It is difficult to prove or disprove an accidental association. Syphilitic epilepsy is infrequent. The writer is inclined to the view that, in infants especially, convulsions are more likely to occur in those who are the subject of inherited lues than in children who are otherwise healthy. In older children syphilis may be the sole cause of mental deficiency and fits of the idiopathic type. Fits of the Jacksonian type and the epileptiform seizures of general paresis are not included in the above statement. While myelitis is a common lesion in adults who are suffering from acquired syphilis, spinal lesions apart from tabes appear to be infrequent in the subjects of inherited lues. The para-syphilitic affections of inherited lues closely resemble those seen in the subjects of the acquired malady. The morbid anatomy of inherited and acquired syphilis of the nervous system appear to be identical. The prognosis in diseases of the nervous system due to syphilis is grave. Early diagnosis is essential to procure a good result from treatment. In the Wassermann reaction and a careful examination of the cerebrospinal fluid we have the most efficient aids to an early diagnosis.

**Etiology of Scarlatina.**—M. C. Lavaditi (*Presse méd.*, Aug. 24, 1912) describes his experiments on the possibility of producing in monkeys a disease similar to human scarlatina, by inoculations of virus obtained from children having the disease. The experiments of the author were made upon anthropoid apes, the chimpanzee and orang-outang. He found three days after inoculation of the tonsils with material obtained from the throat of a child, redness, swelling of tonsils and pharynx, fever, and later membrane on the tonsils, and on the head, neck, and extremities an eruption of small round, red spots, partly confluent. A reinoculation three days after recovery from a first attack showed that a second occurred, no immunity to the virus having been acquired from the first attack. In an orang-outang desquamation was observed. The incubation varies from two to three days; the glands are involved, and there is pultaceous membrane on the tonsils. In two chimpanzees inoculated with a virulent ganglionic emulsion a febrile attack occurred, which was followed by death. Histological examinations of the skin showed lesions similar to those in human scarlatina. The author believes that such inoculations produce a morbid syndrome in the higher apes which is very similar to scarlatina. The lower simians do not show a susceptibility to the disease. The virus appears to exist in the tonsillar or lingual membranes, the blood, lymphatic glands, and pericardial fluid. Its nature is as yet unknown.

**Psychoses of Measles and Simple Anginas.**—L. Lagane (*Presse méd.*, Sept. 7, 1912) claims that psychoses such as occur in scarlatina and other infectious diseases also may occur after such simple diseases as measles and angina. They are the result of a toxi-infection of the brain by the microbe causing the disease, or



of the high fever present. Individual predisposition is important. They occur in children, who are not subject to alcoholism, come at the moment of the fall of temperature, with the beginning of convalescence, and are at their height in four or five days. They consist of intellectual torpor, abolition of the exercise of thinking power, lack of coordination of ideas, hallucinations of sight, hearing, and taste, and sometimes stupor, negation, or agitation. In general they are confusional, and differ much from psychoses ordinarily seen in the infectious diseases. They may be due to congestion from fever, or to alterations of cerebral cells by toxoinfection. In general the prognosis is good. The cerebrospinal fluid is not altered.

**Fractures of the Humerus in the Child.**—Savariaud (*Jour. de mèd. de Paris* Sept. 7, 1912) says that of all fractures in children, those of the humerus are the most frequent. At the upper extremity transverse fracture of the humerus may occur at the point of insertion of the pectoralis major muscle. The deformity is so great that even under chloroform it is difficult to make it entirely disappear. Abduction may remain limited, but adaptation of the movements of the shoulder-blade and thorax will take place that will render operation unnecessary. The fragment of the diaphysis may remain prominent under the deltoid and strike against the acromion. As the bone grows in length this prominence will be carried further from the shoulder-joint and contact will cease, the movements becoming normal. Such a prominence has been mistaken for an osteosarcoma. Fractures of the diaphysis of the humerus are of very simple treatment in the child. Obstetrical fracture in the newborn may be treated by a simple pad and bandage confining the arm to the side of the body. The same treatment may be used in all young children. Fractures of the lower extremity of the humerus are frequent, and complications are many and important. In fracture above the condyles the displacement may be slight, or very great. The upper fragment is pushed forward, lifting the vessels and nerves, and the lower is displaced far back, simulating a luxation. To differentiate we know that dislocation is as rare as fracture is frequent; in fracture there is an ecchymosis in the fold of the elbow transverse and linear. Great abnormal mobility is accompanied by crepitus; in fracture the prominence at the fold of the elbow is small, while in dislocation it is large and rounded. The three points of prominence, condyles and olecranon, retain their normal relative positions. Lesions of the nerves may cause contraction of all the flexors of the fingers, or paralysis of the muscles of the forearm, due to traumatism of the nerves at the time of accident. If the fracture heals without replacement of the fragments the movements of flexion are arrested by the contact of the coronoid with the upper fragment. Reduction is obtained by traction on the semiflexed forearm and pushing the olecranon into place with the thumbs. The arm is then fixed in this position. If the fracture heals in a vicious position with prominences obstruc-



ting flexion these prominences may be chiselled off later. Compression of the nerves may demand operation to relieve paralysis. Traction and time may relieve contractures. The arm often deviates outward after healing. Fracture of the external condyle is frequent. The condyle, epicondyle and end of the trochlea are separated from the bone. In children from three to ten years of age a juxtaepiphyseal fracture occurs. The growing cartilage is involved and osteogenesis is affected later in life. This fracture results from a fall with the hand outstretched to save the body. The signs are not marked; the forearm is flexed at an obtuse angle, there are pain, ecchymosis, and crepitus over the epicondyle. Extension is less limited than flexion. Radiography is of great value in clearing up the diagnosis, by showing a clear spot at the point of the epiphyseal cartilage. After reduction immobilization should be maintained for two weeks, and then be followed by massage and passive movements. Fractures of the epitrochlea are of slight importance.

**Occurrence and Etiology of Club-foot.**—A. Elwenfried (*Jour. A. M. A.* 1912, lix, 1940) finds that congenital talipes occurs approximately once in every thousand births, and in one-tenth of all infants with congenital deformities. In the past five years at the Children's Hospital orthopedic out-patient department 232 new cases have been treated, constituting 5 per cent. of the new patients for that period. Of the two important types, equinovarus constitutes about 80 per cent. and calcaneovarus 20 per cent. Forms which cannot be classified under one or the other of these divisions are rare. The fixed type of calcaneovalgus is less common than the potential type. Equinovarus on one foot and calcaneovalgus on the other is quite unusual. About 70 per cent. of the patients are male, and 30 per cent. female; 55 per cent. are double, and 45 per cent. single. Club-foot is known to have appeared in near relatives in 5 per cent. About 33 per cent. of all the patients are first-born; in about 16 per cent. delivery is difficult; in 4 per cent. birth is premature and in 2 per cent. illegitimate. The condition appears in twins or triplets four times as often as in single pregnancies. It is accompanied by other congenital deformities in 12 per cent. of all cases. There are three etiologic factors to be considered: heredity, evident in 5 per cent.; early intrauterine causes, depending on faulty nutrition from a diseased condition of the chorionic villi, evident in 10 per cent., and mechanical causes operating later in intrauterine life, accounting probably for most of the remainder. In the last class, poor hygiene of pregnancy and work during pregnancy are undoubtedly causal factors of considerable importance.

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## ORIGINAL COMMUNICATIONS.

### WHEN IS THE HIGH FORCEPS OPERATION JUSTIFIABLE?\*

BY

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EXTENDING the indications for Cesarean section has placed the high forceps operation decidedly on the defensive. The limitations are constantly narrowing. Many of our best obstetricians indeed go so far as to reject it as a recognized method in the treatment of dystocia; and, when we consider the many deplorable consequences in the hands of the inexperienced, the torn vagina, the ruptured vaults, the vesical fistulæ, and the fetal lives sacrificed, there appear good grounds for their attitude. When the forceps is used, as it so often is, to do what amounts practically to a cranioclasty, it is to be utterly condemned. The axis-traction instrument will never bring a head through such a brim to the operator's credit, the proper implement being the basiotribe.

The term high forceps, as used in this paper, is understood to indicate application of the instrument to the fetal head when its largest diameters are still above the plane of the pelvic inlet. It thus includes the application to the floating head. It excludes the cases where the head is wedged through the brim, the largest diameters having passed the plane of the inlet, and it is the definition employed in most text-books.

The writer takes exception to the general statement frequently

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made, "never apply forceps to the head above the brim." This may be a safe working rule to hand the general practitioner for his proper guidance, but in the hands of the experienced operator there are not a few cases where a baby's life may be spared, or a mother's morbidity avoided, by the judicious use of the high application. On the other hand, it must be emphasized that high forceps is a major operation, not to be undertaken except by one well versed in pelvic obstetrical work. The bad results are usually those of faulty judgment in the selection of procedure. The wrong selection becomes apparent when no advance occurs with powerful traction. The vanity or the ignorance of the operator then asserts itself. Rather than refrain and change the operation into a properly conducted basiotripsy, he perverts his forceps delivery into a procedure destructive alike to mother and child. There should be ideally no such thing as a "difficult high forceps" in the sense of brute force. The operation may well be difficult, but the difficulty is one to be overcome by skill and dexterity, not by hard pulling. These admonitions have been made many times before, but if we may judge by the obstetrically wrecked birth canals that are continually brought into the hospital, the remarks evidently bear insistent repetition. When then is high forceps to be wisely chosen as the means of delivery?

In the first place, with a fetal mortality ranging between 17 and 26 per cent., it can rarely be selected before the onset of labor as the operation of ultimate choice. It never is an elective operation. If it is the antepartum opinion of the accoucheur that the obstruction to delivery is of such degree that labor cannot be successfully terminated except with the aid of high forceps, elective Cesarean section would be preferable. The maternal mortalities in elective section and high forceps favor the former, while the fetal mortalities are as zero to seventeen at the best. The exceptions to this proposition are few, and include largely diseases threatening the life of the mother, such as endocarditis with broken compensation, advanced phthisis, typhoid fever, the rare condition of myasthenia gravis, and occasionally such cases as one of the writer's, in which in the delivery of a previously Cesareanized patient with a moderately contracted pelvis, high forceps was done to avoid tension on the old uterine scar. She had been delivered by another operator two years before by Cesarean section. There had been a puerperal infection of the uterus, treated with intrauterine douches,

and the integrity of the uterine wound was open to suspicion. The woman left the hospital on the tenth day after the high forceps operation.

The most common problem in deformed pelves of moderate degree is the decision between version and forceps. There is in the minds of many, a legitimate competition between the two. Many operators steadfastly believe their results are better with version in certain types of deformed pelves. This is manifest in the discussions over the preference of version to forceps in flat pelves as compared with the generally contracted variety.

Both the general and the special statistics of the Lying-in Hospital in long series of cases, by many different operators, refute the common opinion that a version is safer than forceps when the largest diameters of the head are still above the pelvic brim. In J. W. Markoe's(1) analysis of 60,000 labors, the fetal mortality in high forceps, including deaths in the first ten days, was 26.16 per cent., compared with a fetal mortality in all cases of version of 41.32 per cent. The objection to these figures for the present argument is that they include indications for version other than those of disproportionment. Let us then compare the results of the two operations as employed in the treatment of 269 cases of recognized pelvic deformity occurring in 30,000 labors in the Hospital Tenement Service as reviewed by Taylor(2) in 1905. From his report the following figures are obtained:

Infant mortality of high forceps in deformed pelves.....	25.0 per cent.
Infant mortality of version in deformed pelves.....	46.6 per cent.

The degree of contraction was approximately the same. Even in pelves in which the conjugate of the brim was greater than 8.75 centimeters the number of children lost by version was 40 per cent. The simple flat pelvis occurred as frequently in the list treated by version as by forceps. The writer's personal experience in dystocia with the two operations also gives preference to the high forceps delivery:

In seventeen high forceps (the head above the brim),

The number of children who survived was.....	14 or 82.4 per cent.
The number of children stillborn was.....	2 or 11.7 per cent.
The number of children dying within ten days was..	1 or 5.9 per cent.
Or a total infant mortality from high forceps of....	17.6 per cent.

In fifty-one versions on living children,

The number of children who survived was.....	38 or 74.5 per cent.
The number of children still-born was.....	7 or 13.7 per cent.
The number of children dying within ten days was..	6 or 11.8 per cent.
Or a total infant mortality from version of.....	25.5 per cent.

The constant ratio between the mortalities of the two operations is obvious. Version is a more dangerous operation for the child, both in simple flat and in generally contracted pelvis. The idea that it is easier to snap a head through a moderately contracted pelvic brim with a version, too often proves disastrous to the unfortunate head. The conclusion that in a given case of contracted pelvis, forceps would prove an unsuitable procedure, should carry with it the corollary that version in that pelvis would be absolutely improper.

While this is neither the time nor the place to go into a detailed discussion of types and grades of pelvic deformity, it seems proper to protest the idea that the treatment to be adopted depends empirically on the size of the true conjugate. In two moderately contracted pelvis with exactly the same measurements by the most careful pelvimetry, the treatment indicated may be entirely different in each, depending on the size and flexibility of the fetal head, or upon the stage of labor. It is particularly in the medium grades of deformity that a practical method of determining the best treatment is so desirable. It has been of great assistance to the writer in the dilemma of the medium deformities to divide them clinically into two classes, depending upon the Kerr-Mueller(3) test of the relative size of the fetal head and the maternal pelvis. This is done by making suprapubic pressure, under anesthesia, directed in a line perpendicular to the plane of the inlet. It is thus possible to ascertain by coincident vaginal touch whether the head can be made to catch or engage in the brim without any great degree of overlapping. If it will so engage, from our own experience and that of others, we are led to believe that it is a *workable contraction*, and that labor will be either spontaneous, or at least safely terminated with the assistance of forceps. If the head will not so engage, or if there is considerable overlapping, we are dealing in the majority of cases with a *dangerous contraction*, and anticipate the necessity of pubiotomy as an adjunct to forceps, or even of the performance of Cesarean section.

The discussion is centered not in the few direct indications, but in the *situations* that arise in which it is advisable to apply the forceps to the head above the brim. We see many cases in which it is already too late to do the proper operation, which would have been appropriate had we been in charge of the labor earlier. It is a matter of attempting forceps because there is

nothing left to do but a possible high forceps or a craniotomy. The situation par excellence for the use of high forceps, and it is a situation with which you all doubtless have had to deal on occasion, is delayed dry labor in a normal pelvis, the head above the brim, and the uterus tightly contracted about the child, with the retraction ring between head and shoulders. Version is impossible, crushing the head will scarcely improve the state of affairs. High forceps is the only practicable procedure, and, providing the child is in good condition, is usually successful. To illustrate:

Mrs. K. had had six children without difficulty. She came to us in her seventh confinement on the morning of Nov. 10, 1910. The cervix was four fingers dilated, the membranes intact, and the head, floating freely above the brim, presented in the R. O. A. position. Measurement showed her pelvis to be normal, except for a slight flattening at the brim, the conjugate measuring 10 centimeters. From the past history of easy labors it was thought proper to rupture the membranes. She was seen by the writer a few hours later on account of the infant's arm having prolapsed alongside and in front of the head. At this time a high contraction ring had formed. The cervix had been fully dilated four hours, and the head somewhat molded was still above the brim, making no progress in spite of strong pains. The arm could not be replaced because of the contraction ring. The Tarnier axis traction forceps was applied, and the head brought down through the brim with the arm extended. There were no fresh lacerations. The baby, weighing 3450 grams, and having a biparietal of 9 centimeters, was in good condition. Both patients were discharged in satisfactory state on the ninth day postpartum.

The following case history similarly illustrates neglected dry labor, but complicated with deformed pelvis:

Mrs. W., a primipara of thirty-four, had been having strong pains for three days, and the membranes had been ruptured sixty hours when I first took charge of her. The pelvis was of the generally contracted flat type with a conjugata vera of 8.5 centimeters. She was evidently exhausted by her long ordeal. The legs, hands, and face were edematous, and her pulse rate was 120. The cervix was fully dilated and the uterus was very tightly contracted around the fetus, particularly between the head and shoulders, where there was a pronounced retraction ring. The head greatly molded, and with a large caput, lay above the brim in the L. O. A. position. The fetal heart was 156 and regular. The woman had been sent in from the Out-patient Department for Cesarean section. But at this time, in 1908, we had learned to beware of opening the abdomen in such cases, and in view of prolonged labor and the exhaustion of the mother, a



high forceps or a craniotomy was decided upon, the latter if the former required more than moderate traction. A pelvic application of the Tarnier forceps was made, and with a few easy pulls the head was drawn into the pelvis. A cephalic application of the solid blades was then made and the child extracted rapidly owing to the failing fetal heart. A vaginal tear of the right sulcus was repaired with two stitches of chromic gut. The baby was in a state of pallid asphyxia and was revived with difficulty after a half hour's tubbing. There was a depression over the left parietal region from pressure on the promontory. Both patients left the hospital on the tenth day in good condition. The mother's highest puerperal temperature was  $99.3^{\circ}$  on the fifth day. The extraction was easier than was expected, but the baby was small, weighing 2400 grams. A larger head would not have come through, nor would this head have safely passed the brim without the prolonged molding to which it had been subjected.

Great aid is rendered in the simple flat pelvis by putting the patient in the Walcher position. This position is of no value in the generally contracted pelvis, but there is no doubt of its importance where the only contraction is in the anteroposterior diameter, as in the following instance:

Mrs. K. a primipara of twentyfour was admitted to the hospital June 25, 1907. She had been in active labor since the previous night without much progress. The membranes had ruptured and the cervix had been fully dilated for seven hours. The head was lodged above the brim transversely, a position typical of flat pelvis. The diagonal conjugate measured 10.25 centimeters, with an estimated true conjugate of 8.75 centimeters, the pelvic bones being light. High forceps were applied, but it was impossible to engage the head with reasonable pulling. The patient's legs were then dropped from the holders and allowed to hang freely from the hips, throwing the patient into the Walcher attitude. The operator seated on the floor between the patient's swinging feet was able, with no harder traction than before, to draw the head into the pelvis. A cephalic application of the solid bladed forceps was then made to the L. O. T. head, and rotation accomplished with the slow wide sweep of the handles, one finger being held against the vertex to be assured that the head rotated with the blades. At the moment of complete rotation the head advanced spontaneously to the outlet, and the remainder of the delivery was simple. There was a second degree laceration in the median line which was immediately repaired. The baby's head had a large occipital caput and the biparietal diameter measured 8.5 centimeters. It weighed 3100 grams, and was discharged with the mother on the ninth day.

Another situation in which high forceps is of great efficacy is in the management of inertia uteri in multiparæ with normal

pelves, but with flabby and relaxed uterine and abdominal muscles. Frequently the membranes being ruptured and the cervix fully dilated, the pains die down and labor comes to a standstill with the head still unengaged. If, after proper rest and stimulation, the uterus does not react, or in case the fetal heart begins to fail, it may become necessary to terminate the labor. With the membranes long ruptured in a multipara version is dangerous for fear of uterine rupture. Forceps is safer for the mother, and, according to our mortality figures, much preferable for the child.

Such was the predicament of Mrs. S. She had had eight normal labors prior to 1906 when the writer delivered her of her ninth baby by craniotomy, the infant weighing 5600 grams without the brains. In August, 1908, she again came on the service, having been in labor two days under the care of her own physician. The belly was pendulous and there had been no pains for some hours. The cervix, fully dilated, was very edematous. It was not known when the membranes were ruptured. The vagina was considerably abraded from attempts at instrumental delivery before admission. The head lay above the brim in the R. O. A. position. The heart was 144 and regular. Version seemed contraindicated on account of the dry labor and the multiparity. A used and abused uterus is not elastic and will rupture readily with a late version. The forceps extraction was rather easy, and a large living child, weighing 4500 grams, resulted. The baby was not so large as the previous craniotomy, but the head had a biparietal diameter of 9.5 centimeters.

Then there is the uterine inertia resulting from the uterus tiring in its efforts to push the head through a moderately flattened brim as in the case of Mrs. R.

Her first baby had been born with the assistance of instruments and had died on the second day. In this her second confinement she came to us with a temperature of 100° F. and a pulse of 120. The length of the labor was indefinite, but the cervix was fully dilated and there had been but feeble pains since the membranes had ruptured twenty-four hours previously. The pelvis was moderately flattened, and the head was partly engaged but easy to push up, and its largest diameters had not yet entered the brim. The fetal heart was 156 and irregular. Meconium was passing. Forceps had been attempted by a "professor" before admission to the hospital. Owing to the slight flattening and the long ruptured membranes, the high forceps operation was selected as preferable to version or a risky Cesarean. The head was rather easily pulled to the outlet with the patient in the Walcher position, and the solid blades substituted. The

child was extracted alive and there was no perineal laceration. Owing to the previous uterine inertia there was a profuse hemorrhage during the third stage, and a manual extraction of the placenta was done. The baby weighed 4000 grams, having a biparietal of 8.5 centimeters. There was a right-sided supra-orbital paralysis for a week, and forceps abrasions on the right and left parietal regions, whether produced by the "professor" or by myself it was impossible to say. Both patients were discharged in good condition on the eleventh day.

Again, high forceps may become justifiable in the dystocia resulting from rigidity of the cervix. Cases occur in which the cervix stubbornly refuses to dilate despite strong uterine contractions, and exhaustion of the mother or child may call for intervention. It is too late for version, and after manual dilatation or some cutting operation on the cervix, the condition of the baby sometimes demands immediate delivery with forceps.

One case, a ii-para, was started up with dilating bags on account of a severe toxemia of the hepatic type. After forty-eight hours of pains the cervix had dilated but three fingers. A manual dilatation of the rigid cervix followed by the high application of forceps resulted in the successful delivery of a 3850-gram baby with a biparietal of 10 centimeters, the woman's pelvis being normal. Incidentally positive smears for gonococci had been obtained before labor. This might be a partial explanation for the inelasticity of the cervix.

Another case, a primipara of twenty-one, had been actively in labor for three days with early rupture of the membranes. The cervix, three finger tips in diameter, was well taken up, but was thick and rigid. The head was above the brim, though under anesthesia it could be made to bite into the inlet with suprapubic pressure. On attempting manual dilatation of the cervix it began to tear, and Dührssen's lateral incisions were resorted to. The child, weighing 2550 grams, was then extracted with forceps. The incisions and a lateral tear of the vagina were immediately repaired. Both patients were discharged in good condition on the tenth day.

Neglected presentations of the brow in normal pelvis may occasionally best be handled by the use of forceps, as in the following case of brow presentation at the brim in a multipara with ineffectual pains:

Mrs. M. was having her sixth baby. The former five had given her no difficulty. The present one was but slightly engaged at the brim, presenting by the brow when I first saw her, the membranes being ruptured and the cervix fully dilated. The brow was altered by the three-hand method to a vertex and

labor allowed to proceed. In three hours the fault had more than recurred, the vertex having slipped all the way back into a face, with the chin posterior, and was no more engaged than before. It was again possible to convert the face, chin posterior, into a vertex occiput anterior, and a high application of forceps was made. Rather harder pulling than is usually justifiable was necessary as we did not have the axis traction instrument at hand. Delivery was accomplished however without harming the 4000-gram child. The mother's vagina being relaxed from her previous labors there was no fresh laceration.

In all of the cases noted, the termination of labor was demanded by the condition either of the child or of the mother. The membranes had been ruptured for many hours and the resources still at hand had narrowed down in each instance to version, forceps, or craniotomy on the living child; with possibly the assistance of pubiotomy in the performance of version or forceps. Appreciation of the general results in long series of cases together with a study of the individual situation had eliminated the propriety of version in each. Forceps and craniotomy then were left. Forceps was chosen each time because, (1) the head was fairly molded; (2) there was but little overlapping with the molding; (3) success in engaging the head through the brim attended one or two moderate tractions on the forceps, sometimes aided by the Walcher position.

Absence of any of these conditions is a distinct contraindication to the operation according Munro Kerr(3) in his recent text-book on operative midwifery. It is unnecessary to mention here the essential contraindications to forceps in general, depending on the condition of the membranes, the cervix, impossible presentations, and more than slight disproportionment.

In attempting forceps in contracted pelves one is tempted to follow the advice of Kerr(3): if after one or two moderate tractions with the forceps the heads fails to engage in the superior strait, either a pubiotomy should be done before continuing with the forceps, or else resort should be had to craniotomy on the living child.

In delayed dry labor when interference becomes necessary, and valid objections are exhibited to the use of forceps, craniotomy is imperative unless the conditions favorable to pubiotomy are present. Pubiotomy at the best cannot be called a method of delivery. It is an assistance to version, forceps, or spontaneous delivery, just as the Walcher position constitutes such assistance in a lesser degree.

To recapitulate:

High forceps must always be considered a major operation, to be performed only by the trained obstetrical operator.

It is never to be selected before labor as the ultimate operation; in other words, it is not an elective operation.

High forceps is preferable to version in the treatment of dystocia due to contracted pelvis.

Before applying the forceps to the floating head, be assured that the head can be made to engage in the brim of the pelvis with suprapubic pressure properly directed.

If in a contracted pelvis the head will not thus catch or bite in the brim, and if there is distinct overlapping, it is almost certain that it cannot safely be delivered with forceps, except with the aid of pubiotomy, and finally,

*Situations do arise* in which it is justifiable to apply forceps to the head above the brim,

(1) *In normal pelves*: in delayed dry labor when interference becomes urgent on account of the condition of the mother or child,

(2) *In deformed pelves of medium degree*: when it is possible, with one or two moderate pulls, to draw the largest diameters of the head through the pelvic inlet.

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- 29 EAST SEVENTY-SEVENTH STREET.

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## THE APPLICATION OF IODINE TO THE EXTERNAL AND INTERNAL GENERATIVE ORGANS OF WOMEN IN THE TREATMENT OF INFECTIONS AND PREPA- RATION FOR SURGICAL OPERATIONS ON THE SAME.\*

BY  
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THE antiseptic properties of iodine has been known as long as have bacteria and probably for surgical purposes use of it antedated that of phenic acid. The oldest surgeons of to-day recall its use for

\* Read at the Twenty-fifth Annual Meeting of The Southern Surgical and Gynecological Association, December 16, 17, and 18, 1912, at Old Point Comfort, Virginia.

such purposes in their earliest association with surgical work. These men resent the claim of priority or discovery of the comparatively recent employment of this element by the Grossich method or some of the later modifications of it. They see nothing original in Grossich's (*Centralbl. f. Chir.*, 1908, October 31, No. 44, page 1289) report of his experience with preparing the operation field with iodine alone and by a technic directly contrary to any previously employed. He absolutely and correctly used it as a complete substitute for the various manners of preparation of the field of operation in vogue at that and all preceding time. Various and multitudinous have been the claimants for priority over Grossich. Many of them refer to publications of years back for substantiating evidence of their priority. Having been interested in this iodine work I carefully investigated these claims and as they have so uniformly lacked in proof I have ceased searching literature on the subject of priority and cheerfully accord to Grossich the honor and credit of first recommending and first using iodine by painting as a complete method of skin preparation for surgical operations and especially, that the skin must be dry to be best effected by the iodine. This special observation is the most important feature of this improved process.

There were disadvantages of this method and probably the greatest was the frequent and oftentimes severe dermatitis that followed the application of the iodine. It arose largely from two causes—first, using a tincture of such concentration as to be extremely irritating; and, second, applying it in too large quantities, permitting it to run down in streams and these streams to coalesce. Then as the alcohol of the tincture evaporated thick deposits of iodine crystals were left in the recesses and on the surface of the skin. Dermatitis and blisters, even of large areas, ensued and were troublesome. Nearly four years ago I determined to overcome this disadvantage, if possible. Greater care was employed in painting the skin and no streams were allowed to form. I was using but 1 per cent. of the crystals in absolute alcohol for catgut preparation, which had been proven by the late Dr. James Carroll, U. S. A., to be ample to absolutely sterilize it and the tincture I was using on the skin was 7 per cent. Therefore, I thought it wise to find some preparation of iodine and alcohol between 1 and 7 per cent. that would be at the same time both reliable as a germicide and less irritating to the skin. After nearly two years of experimental work conducted in the operating-room and by the late Dr. John S. Neate, bacteriologist of the Army Medical Museum, 3 1/2 per cent. of iodine crystals in 95 per



cent. alcohol was determined upon as being the weakest absolutely reliable preparation. This experimental work was embodied in a paper read at the 1911 meeting of The American Gynecological Society (see Transactions for 1911 and AMER. JOUR. OBST., 1911, lxiv, 91-106). Iodine tincture of that strength I used at the same time for plastic surgery about the perineum, vulva, vagina and uterine cervix and cavity. This work was then extended to the tubal mucosa and finally to the peritoneum. About sixteen months ago I took up carefully and systematically the treatment of infections of the uterus and appendages with this tincture of iodine, having used it considerably for such conditions of the vulva, urethra and vagina. After a very large experience with it I remain enthusiastic over its value as a germicide on the mucosa of the uterus and Fallopian tubes and on the pelvic peritoneum.

My colleague in Columbia Hospital for Women, Dr. I. S. Stone, has been deeply interested in this subject under discussion and I would invite your attention to his two published papers, one in the transactions of this society for 1909 and one in the *Virginia Medical Semi-monthly* in 1912 (xvii, 105). Dr. Stone uses but 25 per cent. of the U. S. P. tincture, an equivalent of  $1\frac{3}{4}$  per cent. of the crystals of iodine. In that respect we differ, as my bacteriological findings I think justify the use of a minimum strength twice as great— $3\frac{1}{2}$  per cent. of the crystals and these dissolved in 95 per cent. alcohol.

*Conditions in Which This Treatment is Applicable.*—This remedy may be profitably applied in the following class of conditions.

1. Acute infections of the vulva, vagina, urethra and the whole of the endometrium.
2. Acute peritoneal infections with proper limitations.
3. Chronic conditions following infections of these structures and of the tubes, ovaries and pelvic peritoneum.
4. In pelvic surgery requiring examinations, manipulations or operations on or through the vagina.
5. In such procedures as require opening the cervical canal or uterine cavity from either the vaginal or peritoneal side.
6. As a routine method of preparation of the field of operation on all these structures as well as the rectum.

For several years I have confined the treatment of recent and remote Neisserian infection of the vulva, urethra, vagina and cervix to the application of iodine. I have great confidence in the efficacy of this remedy when applied early. If the condition may be treated before the infection has passed into the uterine cavity or the glands of Bartholin it can often be eradicated by one thorough painting of

the exposed areas below the uterine cavity. If the first application fails a second made three days later commonly succeeds.

Such applications can be made to the vagina and cervix with scarcely any unpleasant feeling being caused but usually considerable burning and smarting follows painting the vulva and perineum and sometimes pain if Skene's glands are thus treated. If either the vulvovaginal or Skene's glands are involved I make the same vigorous onslaught and if the corporeal endometrium be involved the uterus is injected under slight pressure, the patient being anesthetized for the purpose. Should the infection be due to some other agent the same identical treatment is employed. I have not been sufficiently courageous to attempt to employ this plan of treatment—injecting iodine into the uterus under sufficient pressure to drive it into the Fallopian tubes, in acute infectious conditions of the tubes, either suppurative or nonsuppurative. I fear highly virulent tube contents that had not been thoroughly subjected to the iodine bath might be forced through the tubes and scattered over the peritoneum. We all understand how this might occur in pus tubes about which the adhesions are so slight as to be easily separated. When for any purpose the peritoneal cavity is opened I frequently and unhesitatingly apply this preparation of iodine to areas infected, however acutely. Nor do I limit its use to applying it sparingly. Nor do I hesitate to bathe the outer side and, with the syringe, the inner side of a Fallopian tube. I have been amazed at the beneficial effects of such intraperitoneal and intratubal application of iodine. When one has first treated acute and subacute localized peritonitis thus he is not prepared to find the notable freedom from gaseous distention and from localized pain and the comfort manifested by the patients continuously from the time of operation.

In chronic conditions arising from infections of any portion of the female genital tract I freely apply the iodine and aim always to have it reach the pelvic peritoneum through the uterus and tubes whenever these structures are involved. It is now my uniform procedure in subacute and chronic pyosalpex to inject the uterus and tubes as well as possible with iodine before opening the abdomen. If the appendages are matted down and degenerated from a former infection the remedy is similarly applied.

In pelvic surgery that requires examinations, manipulations or operations on or through the vagina this plan of local sterilization is far superior to any other I have used. I have found it has enabled me to revolutionize my surgical teaching. Before employing iodine for preparing surgical fields the time required for such work, although

with less perfect results, required many hours and even when the patient was anesthetized and otherwise ready for operation a considerable delay was necessary for a thorough scrubbing of the field. Having determined that iodine requires a maximum of two minutes to prepare the field I now place the anesthetized patient on the operating table and have several students of my classes examine her after which the iodine is applied and the field thus quickly prepared. The time required for these examinations and iodine preparation is not more than the old scrubbing methods demanded. If from above complete hysterectomy is required the preliminary sterilization of the vagina is of distinct value. If in other pelvic operations done through the abdomen vaginal drainage is employed the value of this sterilization is appreciated. The importance of this vaginal application of iodine is emphasized in radical operation for cancer of the cervix uteri. The high mortality from infection of the peritoneum as a result of breaking of the specimen during its removal and resulting leakage is a striking feature of the recent report of Wertheim's work in this field. This sad complication is best obviated by the use of the iodine to both the vagina and endometrium, preceded by galvanocauterization with or without curetment, if excrescences or craters be present. Since the etiology of cancer is not known I would warn against driving any cancer material beyond the uterus by employing considerable pressure in injecting that organ.

If the cervical canal is to be involved during a surgical operation no little comfort arises from security incident to knowing it is sterile. This is quite a feature of the supravaginal amputation of the uterus. An advantage in having the uterine cavity previously prepared is evident when hysterectomy or hysterotomy is to be done. Myomectomy and even curetage of the uterus are preformed transperitoneally and call for surgically clean fields. A noteworthy fact noticed in my work of the last two years is that the more I have used iodine in the uterus and observed its effects the less I have done curetage. I now recall no gynecological condition of the uterus that stands as a contraindication to the injection of iodine into its cavity and I rarely open the pelvic peritoneal cavity without first preparing the surfaces around the introitus, the vagina and the uterine interior, if not the tubes, with the 3 1/2 per cent. preparation of iodine. I will not describe the mode of applying iodine to the skin surfaces, the vulva and the vagina, further than to say that a Sims' speculum is used for retracting the perineum in exposing the vaginal walls and cervix. Enough iodine will be left in the vagina after painting the exposed surfaces to coat over that area covered by the speculum, as soon as

the instrument is withdrawn. Exposure of the cervix may be made by either the Sims' speculum or some other retractor and it is grasped by a vulsellum and held firmly for the injection. A glass 2-ounce syringe having a conical end about 2 inches in length is loaded with the iodine preparation. It is now inserted into the uterine cavity and the fluid slowly injected with or without pressure as one elects. If pressure is employed the syringe is held in place for a period of time, sometimes as much as two minutes. If the peritoneum is to be reached considerable force and perhaps one to two minutes time as well as all the solution will be required. If only the uterus is to be treated and the tubes avoided half the solution given with slight pressure quickly stopped will be all required. Moreover, if the tube in the latter place be not pressed to the hilt in the external os uteri a return flow will be provided which lessens the probability of tubal invasion.

THE ROCHAMBEAU.

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## CESAREAN SECTION; WITH DISCUSSION OF TECHNIC, AND BRIEF CLINICAL HISTORIES OF TWENTY- ONE PERSONAL CASES.

BY  
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(With Five Illustrations.)

I HAVE a good deal of hesitation in offering this paper to the profession. The number of cases is so comparatively small, and the light shed upon the subject so obviously by reflection, that modesty would seem to have been violated by its publication. However, it may help in the final analysis.

It is evident that celiohysterotomy ("Cesarean section") answers not one, but many, questions. It certainly does not depend only on fractions of inches in pelvic diameters. Once and for all the real question in every operative labor is, What is the best way to deliver this particular child; best first, for the mother and second for the child? If the pelvis is roomy enough and the child small enough the answer is easy; if the pelvis is too small for the child, though every diameter of the former is normal, the answer may baffle the most expert. In the old days the only excuse for abdominal delivery was a contracted birth canal; modern obstetrics has broadened the indications to

include also eclampsia, placenta previa, obstructive new growths, and still other rare emergencies of labor. It is not only the frankly impossible inlet that puzzles the obstetrician, but rather the border-line cases, which are so elusive in classification and which end so often in failure.

Aside from a possible contracted pelvis, Cesarean section (adopting the common nomenclature) requires study of the fitness of this particular pelvis for this particular child; the relation of the child to the inlet (its bulk, position, structure, etc.); is the mother a primipara or a multipara; the clinical history of former labors, especially the fact of one or more stillbirths due to operative delivery; the best treatment of placenta previa, fibroids complicating labor, eclampsia, prolapse of the cord, impacted breech in the primipara. The obstetrical experience and degree of surgical training of the proposed operator is an important factor in electing this method. The place of the operation, home *vs.* hospital, has no special bearing upon the question. In these days of trained nurses, and hospital facilities, the tenement house will not bar the poorest woman from the privileges of a section. There are advantages, however, in having as first assistant, one who is accustomed to your method of work and knows by repetition just what to do and how to do it. Harrar writes (AMER. JOUR. OBST., May, 1912) "Although the dramatic glamour of former years still clings to its execution, the extraction of the child from the mother's womb through an abdominal incision is not a difficult feat. With the employment of modern surgical technic, as in all other abdominal work, it has lost its septic and hemorrhagic terrors."

The obstetrical emergencies, suggested previously, so far as they concern the election of Cesarean section, require in this place only the briefest mention. Leaving out entirely the absolutely contracted pelvis, labor with the relatively contracted pelvis bristles with problems, usually unexpected and immediate, for the general practitioner. First, then, I believe that every one who accepts an engagement for the confinement of a woman, particularly of a primipara, should have a fairly accurate knowledge of her pelvic capacity, before actual labor. Jewett's rule is worth remembering; the true conjugate may be considered normal if the external conjugate is 8 inches, it is possibly contracted if it is 7 inches, it is certainly contracted if it is 6 inches. A narrow subpubic arch, one like the male type, usually obstructs delivery and so does a shortened bi-ischial diameter. If any or

all of these conditions are present, before attempting the major operation primiparæ ought to be given the benefit of the doubt, that is, the test of labor. The obstruction may be overcome by efficient contractions and moulding of the presenting part. But it is not wise to wait too long for this tentative action, certainly not beyond reasonable suffering. Pain is as real a poison as arsenic. A most significant guide for action in these experimental cases is given in Williams' paper (*Boston Med. and Surg. Jour.*, Sept. 22, 1910) where he shows that, "the greatest morbidity follows the high operation, and is in direct proportion to the length of time which elapsed before labor was terminated by interference." Low forceps deliveries have a lower morbidity than spontaneous deliveries; a fact well worthy of the attention of those who cry, "meddlesome midwifery." In multiparæ a history of repeated stillbirths due to operative delivery, has a most important bearing upon the choice of method of birth. Since the most common obstruction to birth is a narrowed pelvis, with a delayed labor such a deformity may be assumed and then, as Capt. Bunsby says, "the bearin' of this observation lies in the h'application o'nt." The best excuse from being caught napping in the presence of these difficulties is the emergency of practice, for even a limited obstetrical experience shows that an easy labor with a small child may be followed by a difficult labor with a larger.

2. Is the child too large for the normal pelvis? The bulk of the fetus can be estimated fairly well without special instruments. Commonly the abdomen of the pregnant woman at term, if of medium stature, measures 36 inches around its greatest circumference, and the uterine tumor, 13 inches from fundus to symphysis. If these measures are exceeded, there is a probability of a large child, twins, or hydramnios. (Two recent cases confirm this statement.) If at the thirty-sixth week or even later the head is not engaged but overrides the brim, it is probably too large for natural birth. I am coming to believe, that a backward position of the occiput means a narrow conjugate, absolute or relative. It is the result rather than the cause of obstruction. Compound or breech presentations sometimes make the pelvis relatively incompetent, and are best treated by abdominal section. (See Dickinson's paper on "Management of Impacted Breech Cases," and my own case abstracted later.) Repeated stillbirths imply relatively too large children, and in successive pregnancies with such children the method of delivery should be



by induced labor or better, Cesarean section. But since in multiparæ quite a proportion of spontaneous deliveries occur in frankly deformed pelves, the natural forces should be given a fair trial before proceeding to major operation. I am aware, however, that just here is one of the battle grounds between the radical and conservative obstetrician; too often the general practitioner must accept the crux of the situation; "You'll be damned if you do, you'll be damned if you don't."

3. In cases of placenta previa with unfaced or rigid cervix, the elective method of delivery is a Cesarean rather than an accouchement forcé with its attendant shock, hemorrhage, and cervical tears. In the presence of such an emergency, the best consultant expert should be called, and if possible the patient should be taken to the nearest hospital for delivery. (See case No. 19 of this series.) Accouchement forcé, that is, operative delivery through an unfaced cervix, in eclampsia, is usually more hazardous to the mother than a vaginal or abdominal Cesarean, and the latter has the approval of our best authorities. The time is coming when all toxic crises of this gravity will be considered hospital cases, where they can have the advantage of expert surgeons and nurses. They certainly ought not to be attempted by the general practitioner.

4. Is the doctor simply a man-midwife, or has he the experience and surgical training of the obstetrician? The question is not whether the child can be dragged, *vi et armis*, out of the woman; rather, how can it be born living and likely to live. The answer depends upon the weighing of one possibility against many others, and manifestly requires good judgment and large experience. Without these one should no more attempt a difficult or complicated delivery than he would an appendectomy or a cholecystotomy. The general practitioner in the lying-in room acts too often as if all that he needs to be an obstetrician is plenty of muscle and a can of ether.

5. Finally, it must be understood that celiohysterotomy is an elective, not a compulsory operation. It is contraindicated with a dead child and in monstrosities, after frequent vaginal examinations, long use of forceps or trials of other intrapelvic operations, and manifest infection. Reynolds has proved that its ratio of morbidity and mortality increases steadily in proportion to the number of vaginal examinations. It is par excellence the hope of the child. In the words of the prayer-book, "it is not to be entered into unadvisedly or lightly," and it may well be added

"but reverently, discretely, advisedly, soberly, and in the fear of God."

The modern technic of Cesarean section is a development from general abdominal surgery. Its principles are fixed by long usage; its details are to some extent experimental. The operation is not restricted to the general surgeon, but is within the capacity of many a general practitioner. The sooner he prepares himself for major capital obstetrics the quicker will the objections of William to "cross-roads surgery" be changed to congratulations. The particular details in the abdominal operation, which I have been led to study, are the site of the abdominal incision, shall the uterus be emptied inside or outside the abdomen, the uterine sutures and their application, and the management of the puerperium.

1. The site of the abdominal incision. It is assumed that the woman is at term; before this, the uterine tumor not being so high in the abdominal cavity as at term, I have found practically that the upper end of the incision should not be higher than the fundus. The modern operation has been developed so recently, that only the latest text-books describe it correctly. Most of the older authorities advise the median or low incision, that is, with the umbilicus at the center of the cut or with the cut entirely below it. Even Dr. E. P. Davis, in "Operative Obstetrics" (1911), writes, "the abdominal incision is made in the median line, at first just below the umbilicus. The abdomen having been opened . . . the abdominal incision is then enlarged sufficiently to permit the removal of the uterus from the abdominal cavity." But Dr. A. B. Davis says, in the "Bulletin of the Lying-in Hospital of New York" (1910), "The abdominal cavity is opened by a median incision 12 cm. (5 1/2 inches) long, extending from above downward to the umbilicus." There are, therefore, three sites accepted for the incision, the "high," the "median," and the "low," each of which may extend into the other as occasion requires.

From my limited experience I have been led to prefer the high incision of the Lying-in Hospital of New York, and it seems to me that it has theoretical and practical advantages over the two others. Dr. Davis makes the following argument for his method: "The high abdominal wound is probably subjected to less pressure than one in the more convex and dependent part of the abdomen, and it has better reinforcements from the recti, whose edges at this point are nearer together in the parous woman and

whose supports are greater as the upper attachments of these muscles are approached. . . . The long abdominal wound is open to the objection that it takes a longer time to close it; more foreign matter in the form of suture must be introduced; it allows readier chance for manipulation and exposure to the open air, and possibly infection of the abdominal viscera. Besides, the danger of ventral hernia must be, in a measure, in direct proportion to the length of the abdominal wound." In the growing popularity of the operation, these statements are worthy of thoughtful consideration.

Just a practical hint in making this high incision. The abdominal wall above the umbilicus is formed of skin and fascia only, but below this point it includes also the recti and more or less fat. On account of this anatomical difference in thickness, the high incision should be made with successive strokes, rather than by a dashing sweep of the scalpel. Otherwise the first cut may go completely through the wall and into the uterus itself, or wound a possibly overlying intestine. The latter unfortunate accident has been reported several times.

2. Shall the uterus be emptied inside or outside the abdomen? The popular method is to eviscerate it before emptying it. I must take issue, again, with the advocates of this plan, and agree with Dr. Davis (Bulletin of the Lying-in Hospital, June, 1911), that "the delivery of the pregnant uterus from the abdominal cavity produces well-marked shock, which is likewise furthered by the unavoidable handling of the intestines, by the abrupt change in intraabdominal pressure and the extensive exposure of peritoneal surface to a temperature decidedly lower than that of the interior of the body." It is my experience also, that when the womb has been emptied outside the cavity, the puerperium was complicated with annoying apathy of the intestines, a condition which was conspicuously absent when it was emptied *in situ*. This experience agrees with that of the abdominal surgeons, who find that intestinal apathy is likely to follow after much manipulation of the intestines. It is nearly, if not quite, as easy to empty the uterus while it remains inside as after it has been lifted out. Besides by using the coffer-dam and lateral pressure, to be mentioned later, less liquor amnii and blood will drain into the cavity when the bulk of the womb occupies it. With a comparatively dry cavity there is no necessity for sponging it nor for interference with the viscera, manipulations which invite infection and shock.

The uncovered uterus presents the following characteristics; if the membranes are not ruptured and labor is not active, the wall surprises one by its thinness, it not being usually more than a quarter of an inch in thickness. If, on the contrary, the membranes are ruptured and labor active, the wall will be correspondingly deep, and an inch or more thick. The degree of contraction is a guide to the depth of the incision. It is a safe practice to dissect through the wall with the scalpel, just below the fundus in the median line, then to pass inside one or more fingers, and upon these as a director to cut down to the isthmus with blunt-pointed scissors. The fingers protect the underlying child, and it is claimed that the scissors cause less hemorrhage than the knife. It is not well to tear the uterus with the fingers instead of cutting it, since the torn edges cannot be closed readily and the tear is not straight as it should be.

In quite a proportion of my cases the incision has been immediately through the placental site. Some operators object to wounding this tissue, claiming that, being exceedingly vascular, hemorrhage is greater than when it is not cut and that this region of the womb does not unite so readily and is more liable to infection than others. I have no data to affirm or deny these claims.

The amount of hemorrhage following the uterine incision depends largely, of course, upon the degree of contraction. Even if the incision is made when the muscle is flaccid, contractions follow after extraction similar to normal labor. But if inertia persists, bleeding from the wound may be checked temporarily by pressing it together with the hand, until the sutures can be placed. The chief source of the hemorrhage seems to be the cut vessels in the incision, and not those in the placental site. Sutures will control the former and contractions the latter. If inertia continues after delivery, contractions can be stimulated by manipulations, by applying towels wrung out in hot salt solution, and as a dernier resort by a uterine pack of gauze or towels. One end of such a pack must be passed down through the cervix, for subsequent removal. The pack is to be used only in the emergency of persistent inertia, since as a foreign body it is likely to prevent efficient contractions and might be caught in the sutures. I have never found it necessary.

As it is evident that the immediate agents for stopping the hemorrhage are the sutures and firm contractions, most recent operators do not use the rubber tourniquet of rubber tubing, once considered so essential, though others require the vessels

in the broad ligament to be sized by the hands of the assistant. The theoretical objection to either of these is, that they invite inertia by cutting off the supply of blood necessary for good contractions. Personally, I do not use these temporizing means for hemostasis, but rely on speedy suturing for that effect.

3. Of the uterine sutures and their application. Study of the uterine scar during subsequent Cesarean seems to show that good union after incision does not depend, *per se*, either on the material of the suture or the method of suturing. The moot points are, shall the wound be closed in layers or *en masse*, by interrupted or continuous sutures? Equally good operators favor one plan to the exclusion of the other, one prefers linen, the other catgut. All agree that, whatever material or stitch is chosen, the suture must be sterile, must last long enough for thorough union, and there must be no dead spaces within the loop. If absorbable suture is selected, No. 3 chromic gut for deep sutures and No. 1 for layer sutures is satisfactory. Twenty-day chromic gut will hold for at least ten days, and beyond this time any material is unnecessary. For unabsorbable sutures the choice may be linen (Pagenstecher), ordinary surgical silk, or domestic sewing silk, all of course well boiled.

Allowing all the advantages claimed for linen or silk, it is evident that its usefulness ends when union has taken place, and then, unlike catgut, is more or less a foreign body, likely to require a secondary operation for its removal. In one case of my series, in which silk was used for closing the uterus, infection followed, and one or more of these silk sutures had to be removed several months afterward. I confess to preferring catgut to linen or silk, and thus far have found no reason to give it up.

4. Now of the method of closing the uterine incision. The interrupted stitch seems to be the most popular, some operators prefer to unite layer by layer with a continuous stitch, and others rely upon relatively few deep stitches. My own choice is for the deep, interrupted suture of No. 3 chromic gut. It is the quicker method, hemorrhage is checked sooner than by the continuous stitch of smaller-sized gut, and coaptation is satisfactory. As a small matter of personal experience I have noticed, that when the womb is firmly contracted the common half-curved surgical needle is too short to include the entire thickness of the cut edges with a single sweep of the needle. With a thick wall it may require two insertions of a short needle—from without in and from within out—to finish the loop. This double inser-

tion takes valuable time and delays hemostasis, therefore a longer needle would be an advantage.

Most of the hemorrhage in the uterine incision seems to come from vessels midway in the body of the muscle, and near the longitudinal center of the cut. The first suture can be placed at any one of these bleeding points, an eighth to a quarter of an inch from the cut edge, and should come out at the same distance on the opposite edge, and be tied at once. Then the other sutures follow, about half an inch apart and from six to eight in all. Each stitch must be tied firmly to provide for subsequent shrinkage of the muscle while contracting, otherwise the first will be found to be loose even before the last are inserted. It is usual to direct, that the decidual layer should not be included with the muscular in the suture, but the objection seems to be more theoretical than practical. Webster ("Obstetrics") says that such inclusion is of no importance, unless it is infected. After tying the deep sutures, the gaps between them are closed by superficial stitches of No. 1 catgut, and finally the uterine peritoneum is folded across the entire length of the seam by a Lembert running stitch of fine gut. This Lembert suture is useful in preventing adhesions between the uterine wound and the overlying peritoneum, omentum and intestines.

5. As one of the details of the puerperium, confinement to bed is apparently shorter after the high abdominal than after the median or low incision. The high abdominal wound is subject to less internal pressure than when it is below the umbilicus. As yet I have never found courage to follow the custom of Dr. A. B. Davis, who allows his Cesareans to leave the bed on the third day, and be walking about at the end of the week. My patients with the high incision are usually out of bed by the end of the week, and walking about after the fourteenth day. After the median or low incision it is the custom to require the bed for three or four weeks, because earlier exercise might be followed by a giving way of the weak scar from internal pressure. Following the high incision the head of the bed should be raised 8 inches on blocks, this position assisting drainage and involution. Adhesions after the high incision are unusual, as shown in subsequent sections; the uterine wound is not in apposition with the abdominal wound, because the womb sinks into the pelvis, as after normal labor, and the two wounds are not in contact. It has seemed to me, that the intestines respond more readily to laxatives after the high abdominal incision than after



either of the others, partly because of the elevation of the head of the bed and partly because normal peristalsis is not inhibited by handling of the viscera so usual in the median and low incisions.

In several of my cases the median instead of the high abdominal incision was necessary, because the uterus had not developed high enough in the abdomen to permit the latter. But, at term, my technic is as follows. Usual toilette of the abdomen with iodine. If there have been previous vaginal examinations, the vagina is cleansed with soap and water and packed with iodoform gauze; with no vaginal examinations or possibly a single one, the vagina is untouched. Abdomen opened from the crest of the uterine tumor down to the umbilicus, about 5 inches. Dr. Cragin, of the Sloane Hospital for Women makes the incision to the right of the umbilicus, in using the median incision, since he finds that the uterus is quite often dextroverted on its long axis. When opened, the hand is passed within to examine for this possibly twisting of the uterus; if found, it should be put in the central position. The abdominal cavity is then protected by wrapping around the exposed uterus a continuous strip of packing-off gauze, like a coffer-dam. Uterus opened in the median line, beginning at the fundus and extended down to the isthmus, the incision being a little longer than the abdominal. The dark, bluish membranes or the placenta rush at once into the opening, the membranes are quickly torn, the hand is passed within and grasps the child's feet, and it is extracted as soon as possible. Then the membranes and placenta are withdrawn, the cavity wiped dry with gauze, and the sutures are applied. All the time during the uterine incision, delivery, and suturing, strong lateral pressure upon the womb through the abdominal walls is kept up by the assistant. At the moment of delivery a dram of ergotole is injected into the buttock. The uterine wound is then closed, in the manner previously stated, the exposed womb wiped dry, the coffer-dam removed, and the abdomen sutured, layer by layer, as after an ordinary laparotomy. The usual dressing is strengthened by adhesive straps, according to the manner suggested by Dr. E. P. Davis, ("Operative Obstetrics"), applied with edges overlying from the top to the bottom of the dressing.

I am happy to acknowledge my special indebtedness to Dr. A. B. Davis, of the New York Lying-in Hospital, for valuable suggestions in the details of the operation.

My series of Cesarean includes twenty-one cases to date. The

first two operations were failures; made years ago before the present era of abdominal surgery, the children being already dead and the women hopelessly infected after repeated attempts at delivery. It seems fair, then, to modern obstetrics to exclude them from consideration with the other nineteen sections, all of which have been made since 1905. A brief history of these will serve for the purpose of record.

CASE III.—July, 1905. Irish, v-para; first four children still-born after forceps extraction. At term, no progress after twelve hours labor. Operation in tenement house. Classical section and technic; linen sutures. Section followed by obstinate constipation, which was finally overcome by heroic treatment. Female child weighing 9 pounds. Obstruction was an exostosis on the promontory. Both did well.

CASE IV.—July, 1906. American, ii-para, very large woman. First child stillborn after forceps. At term. Median abdominal incision, linen sutures, usual technic. Large female child. Uneventful lying-in period, both did well.

CASE V.—August, 1906. American, viii-para, at term and in long labor. Birth stopped by a bony growth on the right ramus, nearly closing the outlet. The enchondroma was thought to be due to injury at that region caused by forceps at the sixth labor. Admitted to my service at the Maine General Hospital where membranes ruptured while being prepared for section. Median abdominal incision, uterus delivered before incision and extraction. Male weighing 10 1/2 pounds, linen sutures. Both did well.

CASE VI.—December, 1907. Irish, vi-para. Third, fourth, and fifth child stillborn after forceps. After several hours of hard labor forceps failed to extract. Taken to Maine General Hospital for section. Median abdominal incision, usual technic, with linen sutures. Male child weighing 10 pounds. Three days obstipation finally yielded to eserine. Subsequently both did well.

CASE VII.—August, 1908. American, primipara, weighed over 200 pounds. After four days labor taken to the Maine Eye and Ear Infirmary (a private hospital), for delivery. Forceps had been applied several times but repeatedly slipped. At operation temperature 103°, pulse 130. Under ether vagina found small and inelastic, presentation O.D.P., cord once around neck and pulseless, and hand presenting by the head. Uterus closely contracted upon the child, and the true conjugate not over 3 inches. After consultation, craniotomy was attempted, but the head could not be perforated, owing to extreme ossification. No sutures nor fontanelles could be found, and she was probably two weeks over term. As a last resort section was made median incision through 2 inches of fat, uterus delivered before emptying. Dead male, weighing 11 1/2 pounds, extracted. Silk sutures for uterus, catgut for abdomen. Mother died third day of sepsis.

CASE VIII.—July, 1909. American, ii-para. First child

stillborn after forceps. Spontaneous labor at thirty-sixth week, no engagement after twelve hours contractions. Section at the Maine General Hospital; high abdominal incision, uterus emptied *in situ*. Eight-pound male. True conjugate 3 inches. Both did well.

CASE IX.—August, 1909. Irish, ii-para; first child stillborn from forceps. At term, in labor thirty-six hours, presentation O.D.P. with no engagement. High abdominal incision, usual technic, chromic gut sutures. True conjugate,  $3 \frac{1}{4}$  to  $3 \frac{1}{2}$  inches. Male child weighing 9 pounds. Both did well.

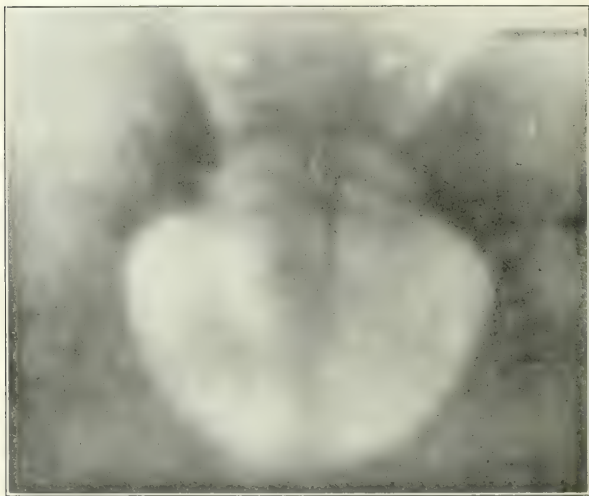


FIG. 1.—Skiagraph of normal pelvis, mother of three children, normal birth. Shown for purpose of comparison with pelvis of No. 16 of this series.

CASE X.—October, 1909. viii-para. Fifth, sixth, and seventh child stillborn after forceps, all deliveries difficult and instrumental. High abdominal incision, usual technic. Female child weighing  $9 \frac{1}{2}$  pounds. True conjugate, not over 3 inches. Both did well.

CASE XI.—December, 1909. American, ii-para, first child born ten years ago and living. Five years after had a fixation by Kelly method, sterile for next five years. Pain increased with present pregnancy until it became unbearable. At time of operation, seventh month, had been in labor for a week. Examination showed a tense abdomen, details of child very distinct

on palpation, cervix high, uneffaced. Evidently the fixation was arresting normal uterine growth. Median abdominal incision. Uterus fixed to abdominal wall by firm adhesions and by broad ligamentous bands. Uterine sac formed almost entirely of posterior wall. Womb incised directly through adhesions, kangaroo tendon sutures for uterus, linen for abdomen. Female child weighing 5 pounds was feeble at birth, but subsequently did well. Mother's lying-in period uneventful.

CASE XII.—June, 1910. American, primipara, very fat, weighing more than 200 pounds. Kidneys and heart normal. Exact



FIG. 2.—Skiagraph of pelvis No. 16 of this series. Shows the deviation to the right of the symphysis, and the inequality of the two halves of the pelvis.

term doubtful, but near. Membranes broke in morning, but pains were absent until afternoon, when there was no dilatation nor engagement. Pains were feeble through night, no dilatation, patient nervous and exhausted, temperature  $103^{\circ}$ , pulse 120. Breech presentation, no fetal movements. At 3 P. M. of second day, examination showed a narrow, inelastic vagina, the os only a dimple, fetal heart sounds doubtful, temperature  $102\frac{1}{2}^{\circ}$ , pulse 130. Under full etherization, vagina slowly dilated manually, breech presentation verified, contraction ring very firm and undilatable. After long efforts one leg was extracted, but the contraction ring prevented any further progress. After additional counsel section was made; high abdominal incision, dead

female child weighing 10 1/2 pounds extracted, gut sutures. Pulse 160 at beginning of operation. Heart failed and despite energetic stimulation patient died on the table.

CASE XIII.—July, 1910. Scotch, short figure, primipara, at term. Intermittent labor for four days with no engagement. Presentation L.O.A., the head overlying the symphysis fully an inch. Section at the Webber Hospital, Biddeford, Me. Abdominal wall very thin, high incision, uterus twisted to right, and incised from center line to left. Usual technic, catgut



FIG. 3. — CASE 10.

sutures, female child weighing 8 pounds. The abdominal stitches began to give way on the third day. By the end of the second week the upper third of the external wound was open, through which a loop of intestine and omentum presented under the dressing. The omentum was excised, the intestine freed, and the wound reclosed. Lying-in period was afterward uneventful and the child also did well. The woman's abdominal wall was so thin, that the various layers could not be distinguished, and were sutured *en masse*.

CASE XIV.—December, 1910. A small, fat Jewess, vi-para, at term. First, third, fourth, and fifth child were stillborn, the second lived. Sent to Maine General Hospital after eight hours labor and frequent examinations. Presentation D.O.P. Section by high abdominal incision, usual technic, linen for uterus, catgut for fascia, and silkworm-gut for abdomen. True conjugate 3 inches. Male child weighing 8 1/4 pounds. Both did well.

CASE XV.—1911. Assisted in operation. American, primipara, at term. Intermittent labor for forty-eight hours with no



FIG. 4.—Case No. 16 of this series.

engagement. Transverse presentation, heart feeble and in right quadrant. Cervix could not be reached with the finger. There had been nine years before some abdominal operation, which was now arresting labor. The next morning there was active labor and membranes had ruptured. Section at the home. Low abdominal incision. Uterus was found bound down on the left side by a shortened left round ligament. Uterine sutures of catgut and silk, feeble male child weighing 7 pounds. The patient did badly; there were stitch abscesses, and one or more of the



silk sutures were afterward discharged through the scar. A subsequent operation was necessary for other silk sutures.

CASE XVI.—April, 1911. American, primipara, age twenty-eight. Says she was born as straight as any child, but at puberty there developed scoliosis. Height 4 feet and 2 inches; has always been perfectly well. Crests 10 1/2 inches, spines 8 3/4 inches, ext. conj. 6 1/4 inches, right oblique 7 1/2 inches, left oblique 7 1/2 inches, post. spines 4 1/2 inches, right spine to trochanter 5 1/2 inches, left spine to trochanter 7 inches, diagonal conj. 3 1/2 inches, true conj. 2 3/4 inches, bi-ischial 2 inches.



FIG. 5.—Skiagraph of pelvis of No. 17 of this series

Section at Maine General Hospital seven days before estimated term. Right transverse position, back anterior. High abdominal incision, usual technic. Female child weighing 5 pounds. Puerperium uneventful, normal lactation, both did well. The skiagraph shows the deviation to the right of the symphysis, and unequal left half of the pelvis. The full length photographs shows the contour of the figure.

CASE XVII.—October, 1911. American, vii-para, seven months and two weeks pregnant. First and second child stillborn after forceps, third pregnancy ended by induced abortion at her request in place of a Cesarean at term, in fourth pregnancy labor induced at seventh month with stillborn child, fifth pregnancy

spontaneous miscarriage at fifth month, and sixth pregnancy the same at the sixth month. Seventh pregnancy ended by rupture of membranes, at seventh month and a half, spontaneously. Section at Maine General Hospital. Even at this early period the head was not engaged and could not be pushed into the pelvis. Crests  $9\frac{1}{2}$  inches, spines  $8\frac{1}{2}$  inches, ext. conj.  $7\frac{1}{2}$  inches, true conj. not quite 3 inches. Median abdominal incision, usual technic, child weighed 4 pounds. Mother's convalescence was delayed by a right phlebitis, child did well.

CASE XVIII.—January, 1912. Same patient as No. 8 of this series. A secondary Cesarean, spontaneous labor having begun at eighth month. At Maine General Hospital. Median abdominal section. The site of the former uterine incision was recognized by two small depressions in the middle line and there was a small adhesion of omentum near the fundus to the peritoneum. Uterine incision to left of former, catgut sutures, and usual technic. Child weighed  $6\frac{1}{4}$  pounds. Puerperium uneventful, both did well.

CASE XIX.—January, 1912. American, iii-para, sent to Maine General Hospital with diagnosis of cancer of the cervix. Last menstruation June 1, 1911, continued bleeding from uterus up to fourth month, none for a month, then irregular bleeding with discharge up to sixth month when there was a small flooding. Four weeks before entrance into hospital there were several small hemorrhages, and four days before entrance there was flooding for several hours. Since entrance there had been spotting, and after the last active hemorrhage fetal movements had been feeble. Forty-fourth week of pregnancy. Examination showed a deep cervical tear on left, tissue nodular about tear, cervix admitted tip of finger, was long and undilated, and there was a little, odorless, vaginal discharge. Abdomen measured 44 inches in circumference, and the uterine tumor 14 inches long. Diagnosis hydramnios, placenta previa, and small child. Median abdominal section, hydramnios confirmed, and placenta lateralis, 6-pound living child extracted that lived a few minutes, usual technic, puerperium uneventful. So far as known the first Cesarean in Maine for placenta previa.

CASE XX.—May, 1912. Primipara, at term, labor forty hours. Breech presentation, no engagement, small, inelastic birth canal. Cesarean was elected rather than an attempt at normal delivery. High abdominal incision, usual technic, child weighed  $7\frac{1}{2}$  pounds, normal convalescence, both did well. The first Cesarean in Maine for breech presentation.

CASE XXI.—July, 1912. American, iii-para, small stature. First child lived after a difficult forceps operation, second child stillborn after forceps. Cesarean elected for third child. High incision, usual technic, normal puerperium, female child weighing 7 pounds.

## CESAREAN SECTION IN AN ACHONDROPLASIC DWARF.

BY

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(With Three Illustrations.)

THE following case of Cesarean section is of interest not only because of the special factors entering into the operative indications, but also because of the unusual congenital deformities present.

The patient, Mrs. F. M., entered my service at the City Hospital, June 18, 1912, having been in labor at that time for forty-one hours. She was a well-nourished woman of strikingly short stature, the shortness being due not to the body length but to the extremities. There was little of importance in her past history except that this arrested development of the extremities was apparently congenital and that her father also had short limbs. She had been married eleven months and her menstruation previous to marriage had always been regular, four to five days in duration, and somewhat painful. The last menstruation was on Aug. 23, 1911.

Pregnancy had proceeded in a normal manner. The onset of labor which was expected about May 31, 1912, did not take place until June 17, at 1:30 A. M. Pains were fairly vigorous throughout the day of June 17. When, however, by 2 P. M. of June 18 the midwife in charge could observe no progress she called in a doctor of the neighborhood who made an unsuccessful attempt at forceps delivery. It was probably at this time that the membranes were ruptured. She was taken to the City Hospital at 6 P. M. the same evening and at once prepared for operative delivery.

When I arrived shortly afterward I found the patient with a full regular pulse of about 100 beats to the minute, a temperature of 100°, sensorium clear, color good. Abdominal examination showed the uterus enlarged to a nine months' pregnancy, in a state of tetanic contraction, with Bandl's ring reaching almost to the umbilicus. The child was lying L. O. A. with the head not engaged in the pelvis. The fetal heart beat was distinctly heard in the left lower quadrant, 120 beats to the minute, and only slightly irregular. Vaginal examination made under anesthesia showed no tears of the pelvic floor or vaginal wall, the cervix partly torn and almost fully dilated and the fetal head wedged

transversely over the pelvic inlet with some overlapping of the parietal bones. The sacral promontory could readily be felt and the diagonal conjugate measured approximately 9 centimeters. Accurate measurements taken later showed the pelvis to measure  $19.5 \times 25 \times 29$  with a true conjugate of  $7 \frac{3}{4}$  centimeters. The choice lay between craniotomy upon the living child and Cesarean section. The previous examinations by midwife and doctor, together with the slight rise of temperature militated in favor of craniotomy, but the unusually good condition of mother and child made me decide in favor of an abdominal section.

The operation was done in the usual manner, the uterus being lifted out of the abdomen and special precautions taken not only



FIG. 1.—X-ray photograph of pelvis, showing marked antero-posterior contraction.

to avoid contamination of the abdominal cavity, but also to avoid touching the peritoneum of the uterus with anything that had been within the uterine cavity. The child was extracted by the feet somewhat asphyxiated, but after a few minutes was crying lustily. There was some tendency to relaxation of the uterine muscle so that the uterine cavity had to be packed with a strip of gauze. Catgut was used for closure of the uterine wound. The abdominal wall was sutured in layers by the ordinary method. Duration of operation twenty-five minutes.

The child weighing  $7 \frac{1}{2}$  pounds showed several bruises where the forceps had been applied but developed normally and both

mother and child were able to leave the hospital in four weeks time feeling well.

A word as to the deformity of the mother. Dr. A. E. Horwitz who saw the patient in consultation termed the condition chondrodystrophia foetalis or achondroplasia. This congenital deformity is characterized by lack of development, particularly of the shafts of the long bones. It is different from congenital rickets and from cretinism and is characterized by:



FIG. 2.—X-ray photograph of hands, showing thickening and shortening of the carpal bones; fingers spreading (main-en-trident).

- (1) Depression of the root of the nose.
- (2) Arrest of development of long bones.
- (3) Normal trunk.
- (4) Main-en-trident.
- (5) Smooth pliable skin.
- (6) Excess of adipose tissue.
- (7) Normal mental condition.

Accurate measurements of the mother's trunk and extremities were taken and these, together with the x-ray photographs

taken by Dr. F. B. Hall, of pelvis, hands and feet (Figs. 1 to 3) show clearly the character of the deformity. In the following table the normal figures have been taken from Stratz's "Die Schoenheit des weiblichen Koerpers," page 208.

	Normal Chondrodystrophia (Mrs. F. M.)	
Body, length.....	166 cm.	141 cm.
Vertex-coccyx.....	85	77
Head, length.....	21	18
Legs, length.....	87	66
Shoulders, width.....	35.5	30
Hips, width.....	34.5	29.5
Pelvis, bispinous.....	25.5	19.5
Pelvis, bicristal.....	20.75	25
Pelvis, bitrochanteric.....	34	29.5
Foot, length.....	22	17
Hand, length.....	19	12



FIG. 3.—X-ray photograph of feet with special deformity of tarsal bones.

The operative indications and technic of Cesarean section seem to me to deserve some modification in the consideration of cases such as the one described. In some of the large clinics abroad where special effort has been made to maintain a good record, every woman who was subjected to an examination outside of the



clinic was considered infected and was refused a Cesarean section in all elective cases. Such a stringent exclusion of possibly infected cases seems to me unfair to the interests of the child. In the presence of an infection as manifested by a temperature of  $101^{\circ}$  or more, or where the mother and child are in bad condition, I should certainly agree with the accepted plan of doing a craniotomy on the living child. Where, however, the temperature does not rise over 100 and the mother and child are doing well, I feel that some modification should be made in behalf of the interests of the child. In surgical work we frequently have to guard the peritoneal cavity from contamination with infectious material. In these cases of *suspected* or *possible infection* a similar method of protecting the abdominal cavity in the course of a Cesarean section can be employed.

I would suggest the following modification of the usual technic:

A 1/2 per cent. lysol vaginal douche should precede the operation in order to wash away as much of the infectious material as possible.

After opening the abdomen the uterus should be lifted out and contact with the abdominal contents avoided as much as possible by a large gauze pack, over which is placed a sheet of rubber dam of sufficient size to cover the entire abdomen. Now a split sheet of waterproof material is thrown over the uterus and fastened at either end of the slit to the proposed line of incision in the uterine muscle. After the first cut through the muscle and before opening the uterine cavity, the edges of the muscle are clasped to the edge of the covering sheet.

After the delivery of the child in the usual manner and the extraction of the placenta, a small gauze pack is placed in the uterine cavity with its end hanging down into the vagina. The operator now releases the clips on the uterus and removes the protecting split sheet.

After a change of gloves the closure of the uterine wound and the abdominal incision can be affected in the usual manner. The assistant whose hands have been compressing the broad ligaments beneath the protecting split sheet will not require a change of gloves during the operation. The uterine pack can be removed after twenty-four to thirty-six hours, depending on the subsequent course of the case and the necessity for drainage. The pack also helps to remove the blood clots that, as Zweifel pointed out, are often found in the upper vagina after labor and increase the danger of infection.

While this technic is merely in the nature of a suggestion and is not based on sufficient experience, I believe that it offers a means of extending the indications for elective Cesarean section to a group of cases that have heretofore been generally treated by craniotomy on the living child.

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## PULSATIONS OBSERVED IN THE PRIMITIVE CARDIAC TUBE OF A HUMAN EMBRYO IN THE SECOND WEEK.

BY

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THE following report has no pretensions to completeness, but simply represents an observation of great interest in the domain of the physiology of the embryo. Only a comparatively few reliable observations are known to have been made on the visible evidences of life in the early stages of the human embryo, which is to be expected, owing to the obvious difficulties in procuring suitable material. Before reporting in detail my own observations, I desire to briefly refer to those which have been made in embryos of birds and mammals. In such cases the observer does not have to combat with the difficulties which attend the study of human embryological material, for as a rule all evidences of life have disappeared long before such material reaches the physician.

Preyer, in his excellent work on embryology, writes as follows: "As it has been determined that an extruded human fetus of four months is capable of motion within the uninjured oval sac, it might be likewise expected that in younger embryos extrauterine signs of life could be observed." The truth of this assumption may be confirmed on the basis of my own observations, and in fact in such an early stage that no outward evidence of life might be expected. Observations on the embryos of fish and amphibia have only been made in advanced stages. The most frequent studies have been made in embryos of chicks, for in the latter there are no technical difficulties to be overcome. Pulsations in the cardiac tube of the chick begin on the second day of development and are of particular interest from the physiological standpoint because at this early stage neither muscle fiber or ganglion cells have been developed. The frequency of the car-

diac pulsations from the second to the eighth day, varies between 90 and 150. Pulsations in the primitive heart of rabbit embryos were observed by Bischoff nine days after conception, and cardiac contractions were observed three hours after the ovum was extruded from the uterus. This same author observed pulsations in the heart of a guinea-pig embryo sixteen days old. The fact that pulsations are continued for some time subsequent to the discharge of the embryo from the uterus, shows the extraordinary tenacity of the heart of the embryonic mammal, an observation which I am able to confirm in the case of a human embryo in the second week.

In the literature to which I have been able to gain access, I can find only a single observation of this character in the human embryo. Pflueger, the well-known German physiologist, reports an observation of this kind in a human embryo of the fourth week. This observer preserved the ovum between two watch-glasses overnight in a warm room, and was still able to demonstrate the cardiac pulsations on the following morning. The heart contracted at intervals of from twenty to thirty seconds and with gradual decreasing frequency, the pulsations lasted more than one hour.

Rawitz observed contractions of the heart in a fetus of 8 centimeters. In older embryos of from seventeen to twenty-six weeks the activity of the heart has frequently been observed. Temperature has a very marked influence, as cold slows and warm salt solution accelerates activity.

Following this brief recital of the observations of others which I found in the literature, I desire to describe my own case, and to call attention to the fact that this is apparently not only the youngest human embryo which has been observed, but also the youngest in which any signs of vitality have been demonstrated. This is due to the fortunate circumstances which I am about to relate.

In May, 1912, I was called to a patient who had a severe genital hemorrhage. The history stated that the last menstruation had taken place six weeks previously. A diagnosis of abortion was made and a vaginal examination showed a partially dilated cervix. On questioning the patient, I found that a number of clots had passed shortly before my arrival which had been collected in a vessel. A careful examination disclosed an intact ovum as large as a hazelnut, of light gray color and with well-developed chorionic villi. The sac was opened with a pair of scissors, and to my surprise I observed distinct

pulsations in the primitive heart. The embryo was 2.5 millimeters long and the yolk sac was distended and as large as a lentil. The well-marked rhythm of the heart was noteworthy and I was able to count ninety pulsations per minute. The cardiac tube was as large as the head of a pin and no auricle or ventricle could be determined. The contractile movement continued for at least fifteen minutes without interruption, but after this became less distinct, slower, more superficial and lasted only about five minutes longer before it disappeared entirely. The specimen was placed in alcohol and subsequently measured and compared with the plates in Kollman's embryology. It was found that the specimen corresponded in size to an embryo of about fourteen days, which agreed with the history given by the patient.

I am not aware of any instance in which such observations have been made in a human embryo of this age, and inquiry among colleagues has failed to elicit any further information. A search of the literature on the subject has likewise failed to elicit any instances of this kind with the exception of Pflueger's case, which, however, is concerned with an older embryo. I consider it of interest therefore to place this case on record.

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## THE INFANT PULMOTOR. AN APPARATUS FOR ARTIFICIAL RESPIRATION ON ASPHYXIATED NEWLY BORN INFANTS.<sup>1</sup>

BY  
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(With One Illustration.)

THE very last cry in obstetrics is the adaptation of the principle of the Draegen Adult Pulmotor to cases of asphyxia neonatorum. For this purpose the original adult pulmotor has been modified and reconstructed so as to be applicable for use in the infant.

The Draegen adult pulmotor in its present construction is the result of experimental work of several years' duration, and, as placed on the market to-day, is a product resulting from tests under actual conditions.

The pulmotor is designed primarily to induce respiration in persons who have been overcome by noxious gases, the apparently drowned, and those overcome by electric shock, or in any other case where the respiration of the patient has stopped entirely, but where there is still slight heart action.

<sup>1</sup> Presented at a Meeting of the Section on Gynecology of the New York Academy of Medicine, November 29, 1912.

The most remarkable results have been claimed for the machine in the short time the apparatus has been on the market, and it is said that many lives have been saved by its use.

The pulmotor's action is to inflate and deflate the lungs in a regular manner, and in the case of the infant pulmotor, by the aid of a certain mechanism controlled by hand the respirations can be so timed that a given number per minute may be obtained,



FIG. 1.—Infant Pulmotor.

or as is so important in asphyxia neonatorum, the inspiration or expiration of the machine may be timed to coincide with the corresponding abortive attempt on the part of the newly born infant.

The complete apparatus is enclosed in a convenient wooden box, and consists of a small high-pressure cylinder of 1 liter capacity, which contains oxygen or varying proportions of

nitrogen and oxygen, under 150 pounds pressure. One cylinder permits of the working of the apparatus for about one hour, and it is only the work of a moment to install another fresh cylinder.

By a reducing valve, automatic in action, the high pressure is reduced to a constant pressure of about 5 pounds. Attached to this reducing valve is also a gauge or finimeter which indicates the contents of the cylinder, and gives warning that the supply of oxygen or combination is running short.

By means of the reduced oxygen pressure, two nozzles or pipe lines are put in action, one nozzle for suction and another for pressure.

The mechanism is so arranged that the first action of the machine is to force oxygen or atmospheric air if desired into the lungs at any given pressure desired, and, second, to empty the lungs of the bad air, which latter is not sucked into the machine to be roused, but is expelled outside.

In this infant pulmotor, unlike the adult apparatus which works automatically, the alternate filling and emptying of the lungs, or respiratory rhythm, is under the control of the operator, thus enabling him to observe the movements of the infant's chest walls, and time inspiration and expiration accordingly, an important factor in asphyxia neonatorum resuscitation.

This control of the inspiratory and expiratory movements is brought about by simply moving a lever upon a dial from one resting point to the other. Beyond this dial, as seen in the machine, are found two flexible metal tubes, one for carrying the fresh air, and the other the exhaled air. The first is the inspiratory or forcing tube and the last the expiratory or suction tube.

These tubes terminate in a breathing mask, which latter should closely and firmly fit over the mouth and nose of the infant. To retain the mask in position, straps are used in the adult pulmotor; an elastic band is sufficient in the infant apparatus.

It is claimed for the machine that a mixing of the pure and impure air is impossible. It is most important, in newly born infants at least, that the extent and amount of inspiratory pressure and suction pressure shall be under the control of the operator.

This is provided for by a water gauge and dial showing the amount of pressure and suction in centimeters, and is readily



and quickly regulated by two sliding valves. The scale reads up to 25 centimeters. In the limited clinical use to which the apparatus has been put, it is pointed out by Roth of Lübeck, that in the newly born inspiration as a rule is most successfully carried with a water pressure of from 10 to 15 centimeters and expiration or suction of from 15 to 20.

Two important details in the technic have to do first with the holding of the tongue forward to prevent occlusion of the glottis; and second, the closing of the esophagus to obviate forcing air into or sucking air out of the stomach.

The former is provided by an attachment to the mask for holding forward the tongue. In its absence drawing forward the lower jaw, or a fine ligature through the tip of the tongue and passed under the edge of the mask will suffice; or another method is to draw out the tongue and catch its tip between the edge of the mask and the face of the infant.

Roth claims from his clinical observations and experiments on the cadaver that the passage of air into the esophagus can be prevented by backward pressure on the larynx.

Roth's statement is as follows:

"The esophagus or passage leading to the stomach is a flaccid, muscular tube, lying between the semirigid trachea and the osseous spinal column. Consequently, the application of gentle pressure on the larynx, situated in the middle of the throat, will compress the esophagus against the spinal column in such a manner as to prevent the passage of air through the esophagus to the stomach."

"This pressure does not restrict the circulation of air in the semirigid larynx."

Roth continues as follows:

"The accuracy of this reasoning has been proved by experiment upon the cadaver, a flexible tube being sewn air-tight in the stomach, and the other end immersed in water. On setting the pulmotor in operation, the air bubbled up through the water; but a gentle pressure, with the finger on the larynx, caused the bubbles to cease immediately. At the same time the chest and diaphragm moved in a remarkable manner, in fact the quiet breathing of the cadaver was astonishing at first sight."

A small rubber bag accompanies the machine for demonstration and testing purposes, as well as to acquaint the beginner with the technic of operating.

Short instructions for operating are as follows:

1. The mouth, nose and throat of the infant are cleared of mucus or foreign substances in the usual manner.
2. The infant is then placed in the dorsal position with the shoulders elevated and head thrown back.
3. The tongue is drawn forward by some means or caught under the edge of the mask which is adjusted firmly over the nose and mouth. In the absence of an assistant, the mask may be held in place by a rubber band passed over it and around the infant's head.
4. The slide valves on the water gauge for pressure of inspiration and expiration are placed at the *o* mark.
5. The oxygen cylinder valve is opened and pressure read on the test dial.
6. The respiratory rhythm lever is moved slowly from the inspiration to the expiration mark and *vice versa*.
7. The esophagus is closed by backward pressure on the larynx.
8. The pressure of inspiration and expiration is increased gradually, constantly observing the chest movements.

28 WEST FIFTY-SIXTH STREET.

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## SOME OBSERVATIONS ON THE DIAGNOSIS OF EXTRA-UTERINE PREGNANCY.\*

BY

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THE diagnosis of a typical case of ruptured extrauterine pregnancy is not difficult to make. The cases in which rupture has not occurred are seldom correctly diagnosed. The detection of this latter condition is of such supreme importance that one should always be on the lookout for it, and in women of the child-bearing age one should be suspicious of any irregular bleeding. The difficulties which may be encountered in differentiating between extrauterine pregnancy and conditions which resemble it are illustrated by the following cases.

The first case which I report was one in which only an examination under anesthesia showed the true condition. The patient who had had one miscarriage and two children came to me March, 1912, with the following history:

Some time last autumn she caught cold during a menstrual period and the flow suddenly ceased. Since that time the periods have never been normal. The flow starts and ceases several times

\* Read before the Washington Obstetrical Society, May 12, 1912.

before it ends. In February, 1912, about the time that a period was due, she had what she called a hemorrhage on exerting herself in getting into the upper berth of a sleeping car. The flow came on suddenly, was quite free but gradually grew less and lasted about as long as her usual period.

On March 21, a few days before I saw her, the flow started about the usual time and was accompanied with considerable pelvic pain. The flow lasted only a day or two and since that time there has been only a slight staining with an unusual feeling of pelvic discomfort. She feels a general lack of well-being.

The vaginal examination showed a large and slightly softened cervix, the os was filled with blood-stained mucus, and the uterus seemed larger and softer than normal, with an irregular boss about the right cornu. The tubes and ovaries could not be satisfactorily palpated on account of rigidity of the patient. She was told to keep quiet and was examined again in a few days. On March 29, when I saw her again, the same conditions were present as at the first examination. She was put to bed for three weeks toward the end of which the nurse reported a discharge of a small amount of what she regarded as foul-smelling pus. On getting out of bed the slight blood-stained discharge commenced again; I tried to examine her again, but on account of tenderness and rigidity the examination was unsatisfactory. I could make out an enlarged uterus but there was apparently marked tenderness in the pelvis and I could not tell whether there was anything outside the uterus which might produce her symptoms. I believed the case to be a pregnancy with a threatened abortion but the possibility of an extrauterine pregnancy kept recurring to me and finally I advised her to be examined under gas anesthesia.

The examination showed a uterus the size of a two and a half months' pregnancy, somewhat softer than normal, symmetrical, freely movable and nothing about the tubes or ovaries which suggested any disease. The uterus had increased gradually in size and one could detect the fetal heart sounds and feel the head and small parts of the fetus. No bleeding had occurred for several months. The patient was a prominent member in society and a mistake in diagnosis would have meant to me a considerable loss of reputation, as well as have been a serious thing to her.

The second case was even more misleading. The patient a young woman who had been married several months was sent by her physician with the following history. At the time when her last period had been due (two weeks before) she began to suffer with pains in the lower abdomen and with inability to pass her urine. She thinks she had fever for a few days. She had to be catheterized. She was examined by her physician, Dr. Hardin, who found a tender tumor to the left of the uterus, the latter being pushed to the right and forward. She had been operated upon for appendicitis a few years before and the right tube and ovary had been removed at the same time. Her

periods previous to the last one had been regular but painful. The examination showed the breasts enlarged and tender. The cervix was nulliparous, but protruding from the os was a dark red tumor about 1 inch in length. The uterus was slightly larger than normal and of a soft consistency. To the left and behind the uterus was a tender tumor mass, oblong in shape, and apparently tensely cystic.

My diagnosis was either an early pregnancy with an ovarian tumor or an extrauterine pregnancy. I agreed with Dr. Hardin that the existence of an extrauterine pregnancy was so probable that an exploratory operation should be done at once. The patient and her husband were not satisfied with our opinion and consulted Dr. Staveland who thought the diagnosis of extrauterine pregnancy was the correct one. She was operated upon at Garfield Hospital February 28, 1912. The polyp was first twisted off without disturbing the uterine cavity. An exploratory laparotomy was next done. The uterine body was somewhat enlarged and soft, giving the distinct impression of an early pregnancy. The right tube and ovary were absent. The left tube was entirely normal in appearance. The left ovary was cystic and contained three compartments in one of which was a firm blood clot which protruded in a mushroom-like mass from an opening in the cavity. The clot surrounded the ovary forming with it a tumor mass the size of an orange.

The ovary was resected leaving behind an amount of normal ovarian tissue about the size of an average ovary. Three days after the operation following cramp-like intermittent uterine pain she passed a sac-like structure which looked like a cast of the uterine cavity. This tissue examined microscopically shows typical decidua but no chorionic villi.

The ovarian tissue has not fully investigated but the sections so far stained show nothing suggestive of an ovarian pregnancy. Whether we had a case of ovarian pregnancy or an early abortion with a hematoma in the ovary is still in doubt.

My third case was that of a young married woman living in Alexandria, Va., seen in consultation Nov. 23, 1911, with Dr. McGuire of that city. She thought she was about three months pregnant, but suffered with constant pain in the lower abdomen. Dr. McGuire felt in that region a soft tumor mass which he suspected might be a tubal pregnancy. She had not menstruated for about three months and showed changes in her breasts and had other symptoms which usually go with pregnancy. Examination showed a condition which was more or less obscure until it was cleared up by an exploratory operation the following day. There seemed to be a soft tumor mass occupying the left pelvis and either a part of the uterus or else ultimately connected with it.

It seemed to move with the uterus, but lay distinctly in the left half of the pelvis. Exploratory laparotomy showed a pregnancy in one chamber of a septate uterus. The pregnancy was

confined to one-half of the uterus, the other half of which was slightly enlarged and showed quite distinctly. The patient subsequently had a miscarriage between the sixth and seventh months of pregnancy. The diagnosis after examination under anesthesia was "probable bicornuate uterus with a pregnancy in one horn," but this was so uncertain that it was deemed advisable to make the exploratory incision.

The next case which I will report was seen last Summer with Dr. Carrico.

She was a multipara about thirty-six years of age. She thought she was about two months' pregnant, and called Dr. Carrico on account of uterine hemorrhage. When I saw her she was bleeding quite profusely, but had apparently passed the products of conception. She was anesthetized, the uterus explored and packed with gauze after it was ascertained that the fetus and placenta were not in it. At the same time a pelvic examination showed a tumor the size of an orange in the right side of the pelvis.

It seemed tensely cystic, was quite movable and I took it to be a small ovarian cyst. The patient did well for about twenty-four hours when she complained of great weakness, dizziness, etc. Her pulse was very weak and rapid, she looked quite pale, her hands and feet were cold and the picture resembled that of hemorrhage. She had, however, no discharge from the uterus, and suffered little abdominal pain. Under the administration of morphine, and rest she improved but in a day or two she had a similar and worse attack.

The fact that I had found a pelvic tumor and that we had not seen the fetus and placenta made me think that we were possibly dealing with an extrauterine pregnancy which had partially ruptured upon the two occasions when she had suffered from the alarming attacks. The symptoms which she then had, I thought possibly due to an internal hemorrhage. Pelvic and abdominal examinations were unsatisfactory, as she was quite stout and the abdominal muscles would not relax.

Dr. G. T. Vaughan was called in consultation. He thought the case was probably a ruptured extrauterine pregnancy, and urged an immediate operation which was done. The laparotomy revealed a small ovarian cyst, but nothing to account for the symptoms of which she had complained. She had subsequently one or two milder attacks like the two described, the nature of them being still obscure.

My next case was a woman thirty-six years old who had been married several years, but had never been pregnant. She complained when she was sent to me Feb. 3, 1912, by Dr. Parker of a slight bloody vaginal discharge lasting since her menstrual period three weeks before. Her menses had been very regular and normal and this period came on at the usual time, but instead of ceasing had continued for three weeks, except a slight pain in the abdomen she was very well. The vaginal examina-

tion was not satisfactory on account of a thick, fat abdominal wall but I could make out a uterus of the normal size. The tubes and ovaries could not be felt.

On account of bleeding I advised a curetage to determine the cause of the unusual flow. She demurred and after a few days later while down town had an attack of pretty severe abdominal pain which put her to bed for a day. I saw her during the day. The pain was not localized to any part of the abdomen which was rather rigid but not distended. Her temperature was normal and her pulse slow. She thought it was a digestive disturbance.

I thought of a ruptured extrauterine pregnancy but in the absence of increase in pulse rate and because my pelvic examination was negative I did not seriously consider it. However, I again urged an examination under anesthesia and a curetage, to which she consented. She was operated upon at the Garfield Hospital, Feb. 6. She was again examined while under anesthesia but not fully relaxed. My notes at the time were that the uterus was normal to palpation and nothing abnormal detected with either tube or ovary. The uterus was cureted. The scrapings being rather more than normal but not suspicious of malignancy, they were submitted to the pathologist for examination.

A delay occurred in the report and the patient went home with a continuance of the slight flow. The pathologists were in doubt about the interpretation of the picture in the curetings, and agreed that it resembled an adenoma more than anything else but could not be certain of the diagnosis.

She was advised to have an exploratory incision, the uterus to be incised and if necessary removed. She and her husband were so much upset and I so much in doubt that I advised that we get an opinion from Dr. Thos. S. Cullen of Baltimore. He examined the stained sections of the cureted tissue and gave as his opinion that the case was one of extrauterine pregnancy. He and I urged an exploratory operation, which was performed the following day. There was only a few drams of free blood in the peritoneal cavity. The right tube was the seat of a small tubal pregnancy the size of the end of one's thumb. The sac was intact and on incising it the minute fetus could be plainly seen floating about in the fluid.

In the light of Dr. Cullen's explanation and what we found upon operating the microscopical picture of the curetings seems very clear, but it had been examined by two pathologists who were unable to explain its meaning. My excuse for not having discovered the condition at the time when she was cureted is the fact that the patient was not completely relaxed. As two weeks had elapsed between the time of examination and the operation the tube had probably undergone a considerable increase in size.

These cases serve, I believe, to illustrate the difficulties which



may be encountered in diagnosing extrauterine pregnancy. I have seen numerous cases in which glaring errors in diagnosis had been made. It is a common mistake to curet cases of extrauterine pregnancy under the supposition that they are incomplete abortions. I have seen more than one patient allowed to bleed to death from repeated hemorrhages because at the same time there was a discharge of blood from the uterus and the internal hemorrhage was not suspected. There is no condition with which the gynecologist has to deal in which unceasing vigilance is more necessary than extrauterine pregnancy.

1730 K STREET, N. W.

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## IMMEDIATE TREATMENT OF DEPRESSED FRACTURES OF THE SKULL IN THE NEW-BORN.\*

BY

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(With One Illustration.)

THE purpose of this communication is to present the histories of three cases of depressed skull fracture in new-born infants treated by immediate elevation, and likewise a simple contrivance for this purpose.

Depressed fractures of the skull may result from injuries during labor produced either by forceps or some projecting deformity in the pelvis. It is quite generally believed that small circumscribed hemorrhages and areas of edema may be present on the surface of the brain as the result of injury, without producing any permanent after-effects. The hemorrhagic or edematous area disappears by absorption and the parts are restored to their normal condition. In the case of a depressed fracture of not too great an extent it is likewise possible that the surface of the brain can accommodate itself to the displacement, but in view of the generally accepted view that various nervous disturbances, including epilepsy and idiocy, may result from birth injuries, it would appear advisable to treat the same as soon as discovered. The simpler the operative procedure employed for this purpose, the better, and although a variety of corkscrew and other appliances have been devised for this purpose, a simple hook, such as obtains in the ordinary double tenaculum forceps, will give

\* Read before the Section on Obstetrics and Gynecology of the New York Academy of Medicine, October 24, 1912.

excellent results. As this is somewhat difficult to apply, however, because it does not fit into the hand, the writer has devised the instrument herewith shown. It consists of a sufficiently large handle, so that this may be grasped and readily held, which is provided with a short hook at right angles to the shank. The point of the instrument is forced by a firm and constant pressure into the midpoint of the depressed fracture, and after the point has penetrated the inner table of the skull the handle is turned at right angles to the surface, and by means of a steady traction at right angles to the surface, the depressed bones are elevated. The only preparation necessary is to clip the short hair over the area through which the perforation is to be made and then to apply a few drops of tincture of iodine to this surface. After the elevation is accomplished, a sterile gauze bandage is applied to the head in the form of a cap and the mother directed to keep the baby on the side opposite to the seat of the fracture.

It is advisable in every labor, especially if the latter is prolonged, or instruments have been employed, to carefully examine the surface of the skull for depressed fractures, and if found they should be immediately corrected. It should be borne in mind that a caput succedaneum may sometimes hide a depressed fracture, and the examination of the surface of the fetal skull should therefore in such cases be extended to subsequent visits. In view of the uncertainty of what may happen in after-life it is not advisable to rely on any possible adjustment of the injured parts to each other, as the procedure advocated is so simple and easily carried out, that it is worthy of trial in every case. The following cases have been recently observed by the writer.

CASE I.—Mrs. —, French, a primipara aged thirty-six, at term and probably over. The patient had been in labor for twenty-four hours when seen by Dr. K. on April 12, 1912, who referred the case to me. During the day she had been visited by two other physicians who stated that everything was normal, and that it was simply necessary to await the end of the labor, although both had attempted forceps delivery. The membranes ruptured spontaneously at 4 P. M., and when called to the case at 11 P. M., I found the patient to be in continuous pain without much intermission. Examination of the abdomen showed considerable rigidity and evidences of a tonic contraction of the uterus. The fetus was in the R. O. A. position with the heart heard in the right lower quadrant, about 160 and faint. The transverse diameter of head seemed to be firmly wedged into the brim and could not be moved from above. The vaginal examination disclosed a soft, but very thick cervix with two fingers' dilata-

tion. The promontory was sharp and the firm engagement of the head prevented a satisfactory measurement of the diagonal conjugate, although it did not seem to be over 10 centimeters. The symphysis was about 6 centimeters wide and the pubic arch moderately contracted, likewise the distance between the tuberosities. The pelvis was of the flat type with a tendency toward the funnel shape. The liquor amnii was apparently drained away and the lower uterine segment firmly contracted around the head and neck. The cervix was dilated up manually to about five fingers, beyond which it seemed impossible to stretch it. In view of the long labor, the frequent examinations, the tonic contraction of the uterus, and the complete drainage of the amniotic fluid, it was decided to extract by forceps, as the child, although not in good condition, was still alive. A pubiotomy might have been resorted to if the patient's surroundings had been better. The application of the forceps blades was very difficult on account of the position of the head and the flattened pelvis. It was only possible to make a pelvic application,

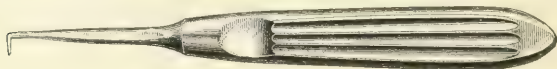


FIG. 1.—Elevator for depressed cranial fractures in new-born infants. Total length 6 inches; inside measurement of hook,  $\frac{3}{16}$  inch. The inner side must be flat and at right angles to the shank. Made by Kny-Scherer Co., N. Y.

which resulted in a fore-and-aft position of the blades on the child's head. The solid bladed instrument was first employed, but as a great deal of traction effort was needed to produce any advance the instrument persisted in slipping backward. A longer pair of fenestrated blades was then applied, by means of which the head was finally dragged down, into and through the midpelvis to the outlet, after which the blades were removed and the head readily expressed from below. The operation was practically a high application. The child was well developed, apparently normal, and weighed about  $9\frac{1}{2}$  pounds. It made no effort to cry, but the contractions of the diaphragm were regular although slow. A depressed fracture involving the left frontal bone and a furrow extending over the parietal region showed where the promontory of the sacrum had left its imprint on the head as the latter came through the pelvis. There was only a slight abrasion on the face from the forceps. A second degree laceration extending up into the right vaginal fornix about 2 inches resulted in an exposure of the sphincter, although the latter was not torn. The repair was readily completed and the patient was left in good condition at the end of the labor, with firm uterine contractions. The child's respirations continued slow and labored, and the heart action was likewise very slow. An attempt was made to elevate the depressed fracture

by inserting a corkscrew, but this was unsuccessful, and then the pointed hook of a single tenaculum forceps was forced into the cleft of the depressed portion through a small puncture wound. This was successfully accomplished and soon after the respirations and pulse rate increased and the child cried normally. It continued to improve steadily and was subsequently seen by Dr. K. who reported it in excellent condition, without cranial deformity.

CASE II.—Mrs. D., a iv-para, with a history of very difficult labors, including two stillbirths and a high forceps extraction, was delivered August 10, 1912, by Dr. W., who did a high forceps operation. The child showed a markedly depressed fracture of the left frontal bone and when seen on the afternoon of the day of birth, the overlying area was markedly edematous. The child's condition about eight hours after delivery was good, respiration regular, about eighteen per minute. The baby did not cry and the lids remained separated, the pupils being equally contracted and showing very slight reaction to light. After sterilizing a small area of skin over the site of the fracture, with tincture of iodine, the hook of a single-bladed bullet forceps was inserted into the skin over the fracture and forced down through the cleft in the bone. The elevation of the depressed fragments was readily accomplished, and when seen on the following day the baby seemed quite normal. It has continued in good condition and was seen by Dr. W. on October 21, who reported that it had gained steadily since birth.

CASE III.—Mrs. G. B., delivered by a member of the out-door staff of the Lying-in Hospital, on August 26, 1912. The patient was an iv-para, with a history of previous easy labors. The present labor lasted only about four hours with an early rupture of the membranes and weak pains. It was spontaneous and no manipulations of any kind were resorted to. The baby weighed about three and three quarters kilos and was not very vigorous. A large caput was present, which for several days prevented recognition of a depressed fracture which involved the left parietal bone and was accompanied by a marked eminence at the temporomalar junction. A measurement of the mother's pelvis showed a diagonal conjugate of 11.5 centimeters with a marked contraction of the outlet. The sacral promontory did not seem to be very sharp, and as the head was not abnormally large and only subjected to a moderate amount of molding, some doubt was entertained as to the production of this fracture. As far as we could learn the child did not sustain any injury after delivery, although this was strongly suspected. The operation was not done until September 6, ten days later, when the elevation was attempted and successfully completed with the aid of a hook introduced through the cleft in the bone. The little patient did not seem to show any effects of the injury before the operation and made a good recovery. When shown at the meeting, the baby's head was smooth and round and only a slight ridge could

be felt along the line of the previous fracture. The child nursed well and gained in weight.

*Conclusions.*—It has been claimed, as already stated, that the cortex of the brain will accommodate itself to the depression produced by a birth fracture of this kind without any essential injury to the child. In view of the frequent aberration met with later in life due to irritations of the cortex, it would seem advisable to remove the possibility of this complication by an operation done at a time when the procedure is a very simple one.

In addition to the three cases here cited, the writer had done a number of others in previous years which, however, have been lost track of. But in every instance the operation was easily done and the after-results good. If the point of the elevating hook is carefully introduced and turned at right angles to the surface as soon as the inner table of the skull has been perforated no injury to the brain substance will result. The point of the hook must simply be sharp enough to readily penetrate the skin, a small area having been previously sterilized with alcohol or tincture of iodine before operating. That fractures of the infant skull are possible without instrumental interference is well shown by the history of the last case and it is therefore advisable in every delivery to carefully examine the child's cranium for this purpose. In every instance which came under the writer's observation where a depression occurred, a fracture likewise resulted, although it is stated that linear fractures can occur without depression.

As appropriate devices for relieving these depressed fractures of the skull may not always be at hand, it has been suggested by Hoffmann (*Med. Klin.*, Nov. 12, 1911) that manual pressure be employed for this purpose, the head being held in both hands with the thumbs on one side and the fingers on the other side of the depression. Counter-pressure in a concentric direction is then employed until the depressed portion of the bone returns to its normal level. Although the writer has attempted this procedure in only one instance, he is not impressed with its practicability. A recent experience of O. v. Herff (*Zentralbl. f. Gynäk.*, Sept. 28, 1912) rather confirms what may result in such cases, although v. Herff does not seem to be unfavorably impressed by his result. In his case, after a version in a narrow pelvis, the baby, which presented a deep depression of the right parietal bone, was treated by him by the manual counter pressure, and although relieved of its asphyxia and embarrassed respiration, lived only two hours. An autopsy showed that an intracranial hemorrhage had occurred which he attributed to a laceration of the tentorium, although there were also hemorrhages in the suprarenal capsules, kidneys, lungs, and pleural cavity. Nevertheless it seems to me that the force which must be employed in a procedure of this kind is unnecessarily severe, and that better results can be obtained with an instrument such as that here noted. The fact that a manual procedure can be

applied immediately and by anyone should not be regarded as essential in the treatment of depressed cranial fractures, because the method by instrumental elevation can be carried out readily enough with the appliances that ought to be found in the obstetrical bag of every practitioner. I do not believe therefore that we ought to rely on any method which will not produce the desired result without a possible extension of the trauma already present and the serious consequences resulting from the same.

23 EAST NINETY-THIRD STREET.

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## TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRI- CIANS AND GYNECOLOGISTS.

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### FURTHER EXPERIENCES WITH THE GILLIAM OPERA- TION FOR SUSPENSIONS.<sup>1</sup>

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

BY

EDWARD J. ILL, M. D.,  
Newark, N. J.

At the sixteenth annual meeting of this Association, held in Chicago, in 1903, I presented a clinical contribution to the Gilliam operation, with a report of eighty-six cases as done after the method described by Gilliam, but with such modification as seemed desirable to me. At that time, I prefaced the report by saying that I wished to support and to carry along the knowledge of a really valuable and safe operative procedure and to do honor to its originator, a valuable and honored member of this Association.

We have now to record 783 operations. These operations were performed either by Dr. Charles L. Ill, myself, or by our staff of assistants. We thus have the records of more and less experienced hands, a valuable means of judging an operative result. Seven operators had from one to three operations each. We have had, among these, three deaths. Two occurred in the hands of one assistant, the other in our own hands, and this one died of pneumonia in about ten days.

In my former paper, I have reported a case of failure, as produced by an atrophy of the distal end of the round ligament. It was my opinion, at that time, that this was due to strangula-



tion by the suture; and in all future cases but half of the loop of the ligament was to be fastened to the fascia with but two sutures instead of three. The result was that no recurrences of such character took place.

What recurrences there have been were exceedingly small and amounted to seven cases. The first case occurred in October, 1903. She was operated on again early in 1905, and in two succeeding examinations, in 1903 and 1909, showed that she was in perfect condition. At her second operation, it was seen that the ligament was very much attenuated.

The next case appeared in December, 1903, and four months afterward proved a complete failure. A second operation showed an entire separation of the ligament from the abdominal wall. The ligament was very much thinned out at the location of the suturing. The second Gilliam cured her as was shown by an examination five years later, in January, 1909.

The third one was operated on in October, 1904, in a multipara, and already showed a relapse two months later. It was found that the adhesion of the round ligament had entirely separated from the fascia. A second operation was followed by cure.

The next case was recorded in a single woman in December, 1906, six months after the operation. No further operation was permitted.

The fifth case was operated on in June, 1905. In December following, it showed to be a failure. She was again operated on and three years later remained perfectly well. In this case, there seemed to be a marked attenuation of the round ligament.

In May, 1908, a failure has been recorded. This was a single woman, and although the uterus was not again retroflexed, it sagged so far toward the sacrum that there was no relief from the symptoms.

The last failure recorded was operated on four months ago, and a reexamination only a few days ago showed a complete failure.

Four of these cases were in our own hands, and three in the hands of the assistants.

All these failures showed a percentage of less than one. Of these, five were cured by a second operation; in two, no further attempt was made. It seems to me that if the operation had not been done on single, childless women, there would have been a perfect anatomical result.

I speak of this because operations in single women or those who have not had children, and where it can be shown that the condition is of recent date and possibly due to some injury, have presented the most frequent failures. For several years now we have not attempted operations in this class of cases, with rare exception. They have proven to be failures, both because the uterus would not stay up, for reasons to be spoken of later, or else they were not improved in their symptoms. For instance, Miss S. was operated on in May, 1906. Six months later she returned without any improvement. While her uterus was anteverted, it was very low in the pelvis. The uterus would not stay up because of a retroposition of the uterus, produced by short uterosacral ligaments. Most assuredly retroflexed uteri and short uterosacral ligaments form the strongest contraindication for operation.

Of the 783 cases, 265 were uncomplicated retroflexions or versions. The rest presented themselves with various injuries of the vagina, cervix, and perineum, or pelvic inflammation. Fourteen had retrodisplacements with fibroid tumors. A myomectomy and Gilliam's operation cured these cases.

Now and then great difficulty was experienced in bringing up the ligament when there was great tension of the abdominal muscles or stiffness in the broad ligaments. At other times it was found that one ligament had not developed at all, and the other ligament was called upon to do its work. A case operated on in December, 1904, and which was reexamined and found cured in 1909, showed an almost complete absence of the round ligament on the right side.

The technic of the operation has not varied from what was published in my first paper, and consists of opening the abdomen in the middle line, just above the pubes. The round ligament on each side about 3 centimetres beyond the horn of the uterus is caught up with a strong silk loop. The recti muscles are now separated on both sides from their anterior fascia, until about half of each rectus muscle is exposed. A sharp-pointed forceps is now plunged through the rectus, its posterior sheath, and peritoneum, into the abdominal wall, and the round ligament drawn through this opening by the silk loop. The loop of the round ligament should be 1 1/2 centimeters in length and stitched to the posterior surface of the anterior sheath of the rectus with two chromacized catgut sutures, of a very fine character. The suture should be applied just tight enough to hold

it in place, since the strongest kind of adhesion is formed from the fibroperitoneal contact. The ligament should be fastened to the sheath so the loop will turn downward. Closure of the abdomen by a layer suture finishes the operation.

We have no accidents to report as a late result of this operation. Miscarriages, dystocia, malpositions of the fetus, obstruction of the bowel, hernias, or disturbances of the bladder have been unheard of. Nor have any recurrences been reported, following labor.

There has, however, been one annoying feature, which I have spoken of in my former paper. Once in possibly a hundred cases patients have had pain at the site of the fixation of the ligament for some months, a condition which was very annoying to them. One single case had not recovered from this pain in over a year, after which she became pregnant and in due time the pain disappeared. I judge that the pain is due to an inadvertant adhesion of the tube to the abdominal wall and have exercised great care not to have such a fixation since.

I am not aware of any other operation that can give one a like gratifying result and which one can so freely recommend in cases which form no other contraindications, and where one can promise so much. The Gilliam has superseded, in our hands, all other operations including the Alexander Adams operation, of which we were so fond twelve and fifteen years ago, but which presented a great many more failures than are recorded by the suspension by the round ligament.

1002 BROAD STREET.

## A NEW SURGICAL PROCEDURE FOR RETRODISPLACEMENTS OF THE UTERUS.<sup>1</sup>

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

BY

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IN looking over the literature of retrodisplacements of the uterus, I have found sixty-one different operations or modifications of operations for its correction. Some other investigators give even a greater number—more than seventy.

That we have so many methods and that surgeons are daily trying to devise new ones, and are even recording several each year, are strong evidences that no method has proven sufficiently satisfactory to give it general acceptance. However, in dealing

with many other morbid conditions of the uterus, less common than retrodisplacements, surgery has evolved for each a generally accepted procedure in which the underlying principles are so sound and the results so gratifying that the efforts of the operator to-day are directed chiefly to the improvement of technic.

The following sentence is from E. C. Dudley: "I believe that the surgical treatment of deviations of the uterus and associated pelvic organs is far from settled, so far, that perhaps some of the hysteropexies, the ligament shortenings, the suspensions, the fixations in their wide divergence may to the next generation look as crude and unscientific as the routine clamp and drainage tube in ovariectomy now look to us."

The doubt and uncertainty that still cling to this subject of retrodisplacements are incentives to discussion, to the thinking out and the trying out of new methods.

I feel that for the past two years I have been successfully practising what might be considered a new surgical procedure for retrodisplacements of the uterus. To discuss the principles on which it is based and to give the technic are the aims of this paper.

To-day it is proved by histologists, and quite generally accepted by anatomists, that the chief tissue of the so-called *uterine ligaments* is involuntary muscle.

E. P. Reynolds, in a recent article discussing this subject says: "These muscles and their action are often visible in the course of operations on the living woman."

Daniel H. Craig, in speaking of the uterosacral ligaments says: "In fact there is so much muscular tissue in their composition as to make the designation 'ligament' a misnomer."

It seems to me that only during the past two years have surgeons begun to appreciate keenly the fact that these so-called "ligaments" are muscular in structure and in function and that they merit the same consideration and the same treatment when relaxed and overstrained, as do any other muscles of the body under similar conditions. This idea has found expression in modifying the underlying principles and technic of but few operations as practised at the present time. And before we can evolve the accepted operation of the future, we must learn to think of these structures as "elastic muscles with duties to perform," and a good start could be made at once by calling them *muscles*.

I have been able to demonstrate that these structures readily

contract by the application of electrical stimulus, and we all know that the round ligaments, in particular, develop in pregnancy in proportion to the work demanded. These are phenomena that do not apply to ligaments under any circumstance.

There is no one, fixed, normal position of the uterus, but there are many positions within the range of normal. The position of the uterus, at any given time, within a normal pelvic environment is dependent upon the resultant of the forces of intra-abdominal pressure, of gravity, together with the coordinate pull of whatever muscles are acting at this particular time. The fact that the uterus does change its position within the range of normal from time to time, might be interpreted as nature's method of securing a degree of rest for these muscles in their apparent rhythmic action.

Excessive nerve stimulus from any pelvic lesion may cause tonic contraction of the muscular fibers of one or more ligaments of the uterus for a considerable period of time, depending upon the duration of the exciting lesion or the length of time before the tonically contracted muscle is tired out. Only under such circumstances can I imagine that these muscular bands exercise a ligamentous function, and then their action can only be interpreted as an effort to quiet and fix and thereby protect this all-important pelvic organ and its appendages.

No one ligament, or muscle, can normally exercise its seemingly special function of keeping the uterus within a certain range of position without the assistance of all the other muscles. Any normal independent function exercised by a given muscle is dependent upon the normal coordination of the others. The plan of this natural coordination is interrupted at once by pathology or hereditary defects anywhere within the pelvis. Just as long as each of these muscles can meet the demand made upon it, just so long is the integrity of all secure, and no longer.

I wish to emphasize the fact, that in every acquired malposition of the uterus of whatever nature, not only one, but all the ligaments are concerned, as all are concerned in maintaining the normal position. And it must follow that in the correction of malposition by the surgeon, not only one, but all the ligaments should receive his attention. Moreover, if they are all concerned, if they have a common pathology varying only in degree, excited by the same lesion, it would naturally follow that they should all receive a similar surgical measure for relief.

Recent literature will bear me out in the statement that the uterus is but slightly suspended by any of its ligaments. It is true the peritoneal fold of the broad ligament passes from each side of the uterus to the lateral walls of the pelvis as high as the external iliac vein and thus may possibly exercise a little upward pull. While this ligament hardly suspends the uterus, it does give considerable support to it in quite another way. The anterior layer of the peritoneal fold of the broad ligament is vertical at its pelvic attachment, but as it passes inward, it gradually turns, so that when it reaches the normally placed uterus, it faces forward and downward to a considerable degree under the body of the uterus, thus supporting it on an inclined plane. The uterus cannot slide down, nor off, this plane, because it is fixed to it by dense connective tissue, but under many given abnormal conditions, it may be caused to descend by changing the incline of the plane to the vertical and then dragging the plane with it. The first step in a descensus, or in a backward displacement, is a change from the normal forward incline toward the vertical. The physiological incline is *directly* maintained by the muscular action of the round ligaments, the uterosacral ligaments, the broad ligaments, and the cervical attachments of the uterus, and *indirectly* it is maintained by intraabdominal pressure. Any impairment or modification of the supports or forces acting along these lines, if long continued, will change the incline of the plane and thus soon be followed by displacement. Again, the weight of the uterus alone may be sufficient to cause the giving way of its support and muscles, if they do not undergo a corresponding development.

I believe that every displacement of the uterus with symptoms is a sequela, a secondary affair. If we cannot trace it as such, it does not alter the fact, but demonstrates our ignorance. I am sure we are all agreed that the treatment should begin by first correcting the exciting cause and thus making the displacement as expressed by Baldy, an incident.

The discussion of the exciting causes is beyond the limits of this paper, but after the cause has been removed, we will still have a displacement and it will ever remain so without the aid of the surgeon, occasional pregnancies excepted. But what is the pathological condition to be overcome now? The answer may be made in few sentences: Relaxed, overstretched, elongated muscles; muscles that have lost their highly specialized function of contractility and hence their adaptability to do work; muscles



that now truly resemble, in their pathological state, what they have so long been called in their normal state, "ligaments" but poor ligaments, for they readily stretch and yield. The pathological changes I have described in the muscles attached to the retrodisplaced uterus apply to all in a degree, but affect the round and uterosacral ligaments the most. It is a recognized fact, frequently demonstrated by the practical experience of the surgeon, that such pathological changes in muscles wherever situated in the body, are best corrected through nature's simple therapeutic measure, rest. When a fairly normal blood and nerve supply are intact, the low grade of connective-tissue formation, ceases through rest, and its absorption soon follows. The delicate spindle-shaped or ribbon-like fiber cell of the muscle may undergo marked atrophy, but so long as the integrity of its nucleus is conserved, it will still have inherent power of regeneration. After regeneration has been attained through rest of function, development will soon follow through physiological exercise of function. Rest is the all important factor in this process and it certainly could never be attained by turning or twisting and pulling a muscle, or by changing its relative position and at the same time giving it more work to do. These are the very causes that brought about its pathological condition.

The involuntary muscle wall of a chronically overdistended urinary bladder readily contracts by means of the rest secured by drainage. The same applies to the stomach. Dilatation of the heart yields to no other measure well as to relative rest.

Anatomically the so-called "uterine ligaments" are muscles, hence their function as planned by nature must be that of muscle. Their coarse pathology in retrodisplacement of the uterus is that of overstretched muscles and hence their treatment should be that for overstretched muscles, rest. I feel that the desired rest can be attained best, with little trauma, by the introduction of an artificial round ligament of kangaroo tendon. This may be made to rest, not only to the round and the uterosacral ligaments, but the broad ligaments as well, when necessary, by making the attachment of the distal end a little higher to the abdominal wall than that of the normal ligament and the proximal end, a little lower to the uterus than the normal ligament. After a trial of various other suture materials, such a chromicized catgut, fascia, and silk, I found the kangaroo tendon the best. Kangaroo tendon retains its tensile strength for a longer period of time than is necessary for these muscles to retain their tone and

function. In this respect the following from Ochsner, writing of his ventrosuspension operation, is of interest: "This temporary ventral suspension (with catgut) will give the round ligaments an opportunity to contract and regain their tone and, when the time comes they will be capable of performing their duty in giving the uterus its proper support, especially as the uterus will now be free and will soon regain its normal weight."

William Alexander is of the opinion that the uterus has no tendency to retrovert at the end of three weeks.

The operation I am doing is simple and is as follows: After finishing all other work in the abdomen, I pick up the round ligament with a small volsellum or forceps. Gentle traction will make the ligament taut and thus direct the finger to the internal abdominal ring. With the finger outlining the ring, the arched fibers of the transversalis muscle can readily be felt above. At this point, just above the tendon of the round ligament, a suture of whatever material determined upon is introduced on a curved needle, from below upward, sufficiently deep to secure a good bite of the transversalis muscle. This suture is now anchored and will include peritoneum, transversalis fascia and muscle. External pressure over the internal ring will facilitate this step of the operation. The peritoneal coat of the distal end of the round ligament is now pierced and a continuous suture, subserous chiefly, is run parallel with the round ligament up to  $1/4$  inch of its uterine attachment. The broad ligament is then pierced a short distance from the uterus beneath the ovarian ligament. This ligament may readily be included in the suture in such a way as to take up its slack, if prolapsus of the ovary is present. The needle is then made to enter the posterior wall of the uterus just beneath the serous coat, passing slightly downward and inward to the median line. This procedure is carried out in like manner on the opposite side. The two free ends of the suture are now tied with a single knot and sufficient tension is made to produce the degree of ante flexion required. The knot is now made secure. This procedure was first introduced as a supplement or reinforcement to some of the recognized operations for shortening the round ligaments and only for the past two years have I used it alone, unassociated with any other operation. The first eight cases were in women after the menopause, or in women from whom I removed the ovaries or tubes, or both. Silk was the suture material used and the results have proved most satisfactory in all. About fourteen months ago I began

the use of kangaroo tendon and applied the operation to women in whom future pregnancy might be expected. Again, the results have proved most satisfactory. At the present time, in practically all cases, kangaroo tendon is the suture used. Sixteen consecutive cases operated on from four to fourteen months ago, bear convincing testimony of the merits of this suture and the operation. No relapses, no sequelæ, and yet most of the operations were performed in the free department of the Samuel Merritt Hospital, upon "working women" in whom straining and lifting are essential factors in their daily work.

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## DISCUSSION ON THE PAPERS OF DRS. ILL AND BUTEAU.

DR. ALBERT GOLDSPOHN, Chicago.—I am glad to be able practically to second everything that Dr. Ill has said, although my experience with the Gilliam operation, the modified operation, that I do is not so long in duration, yet it is an operation I have done in about 100 cases each year for six or seven years. The operation that Dr. Gilliam does, I think, is different from the one that I do, but I am willing to give him credit. Every man has a right to make modifications to suit his own ideas. I draw the uterus up more firmly so as to touch the abdominal wall, and in drawing up the loop of round ligament I take with it the peritoneum enveloping the same, in order to support or reinforce its muscle. We must bear one principle in mind, namely, that muscle anywhere in the body will not stand constant tension, and it must be reinforced by efficient structure, usually fasciæ. We find that this obtains everywhere, as in the peri-

neum, or the abdominal wall. Therefore, the round ligament is only a part of it, and with it, enough of the broad ligament peritoneum is taken to make the structure sufficiently strong to be durable. By being drawn up in that manner it occludes the space where the bladder lies beneath the structures. The intestines thereafter do not enter, and with this technic there has been no intestinal obstruction, no trouble from the intestine becoming incarcerated between the uterus and the abdominal wall, so that the idea of occluding that space by some special device or technic in connection with the operation is not necessary. This method of operating is possible with all kinds of cases, even where there is a good deal of inflammatory infiltration. While the technic of Dr. Barrett and Dr. Montgomery of Philadelphia, and Dr. Noble, and the Mayos and others, which is sometimes termed an internal Alexander operation, where the ligament is taken and drawn into the abdominal wall at about the point where the internal abdominal ring is—this requires so much splitting, so much severing of tissue, so much mutilation, which is not possible in cases where there has been a good deal of inflammatory infiltration. An operation after the Gilliam type is simpler than are the other methods, no matter how much theoretical objection there may be to it. They cannot do in many cases what we can accomplish with the Gilliam or modified Gilliam operation.

The second speaker embraced a principle in technic which is positively fallacious, namely, that the round ligament will under all conditions recover itself by rest. That is not true. It is true only when the opportunity for rest is given the round ligament immediately after or within a limited number of weeks after a childbirth when involution of the uterus is not yet completed, or when it has been arrested or delayed by injury, infection or by retroversion, we can then reinvoke that physiological process by getting the uterus in position and giving the round ligament rest. Under these conditions alone will the round ligament retract. It does not do it under ordinary conditions, otherwise it would recover itself with pessary treatment which practically cures no one.

DR. RUFUS B. HALL, Cincinnati.—I did not hear all of Dr. Ill's paper, and therefore I will not attempt to discuss it; but in reference to the technic of the Gilliam operation or its modification, I am willing and anxious to give Dr. Gilliam credit for his invention of this operation, and in all my records where this operation is done I mention the name of Gilliam. What I say will not have any reference to Dr. Gilliam. I made the Gilliam operation within twenty minutes after I read his first description of it in a medical journal. It impressed me as an operation that was better than anything that had been described previously. I did a dozen or more typical Gilliam operations, but theoretically there was a defect in the technic of the operation. In splitting the muscle, going through, picking up the round

ligament, pulling it through the outer end of the ligament, leaves a space between where you puncture and carry it up through to the external or internal abdominal ring, there is a piece of peritoneum resting against peritoneum which leaves the possibility of a strangulated intestine. Doubtless there are some present who can recall an early paper from me opposing the fixation of the uterus forward on account of intestinal strangulation following. At that time I reported several cases, and I assume there were several unreported deaths from that cause, because I had two or three of my own neighborhood that had been unreported, and are still not reported. I gave up fixation of the uterus early in its history for that reason. I abandoned the Gilliam operation for the same reason that there is a possibility in the technic of the operation that might cause that accident. In other words, there is a defect in the technic that ought to be overcome. After I made a few operations I said I could overcome that defect easily. After separating the space for an inch and a half or so back on the fascia, splitting the fascia then with a crooked forceps through a narrow opening in the fascia with an instrument which I especially devised, I found I could slide along over the muscle, and by putting traction on the round ligament with the hand inside, you can pass the forceps over the top of the muscle to the internal ring, and you only have peritoneum between the point of the forceps and finger. Force the forceps through into the abdomen. Then you take the ligature and pull the ligament through; with this you pull the ligament through the opening from the internal ring over the muscle back to the point where you want to fix it, then you take all of the outer end of the ligament and pull it through and fasten it, then you have a ligament that is a splendid round ligament *that extends from the uterus to the internal ring* where nature fixed it, and you have a longer piece of round ligament. You can put the uterus in any position you want. I do not carry the uterus as far forward as was mentioned by Dr. Goldspohn. I think the nearer normal you can place it, the less likelihood there is of a dragging sensation. If you get it too far forward it is likely to cause a dragging sensation for months along the line of suture. That is the modified operation I have done and followed since Dr. Gilliam read his paper. I am pleased with it. I have a dozen patients who have borne two or three children after this operation had been done upon them, and it stands the test of child-bearing. As Dr. Goldspohn has said, that is the test in these cases, namely, whether the uterus will stay forward or not after childbirth.

I want to commend the author of the last paper for his work along original lines, but whether it will stand the test or not I do not know. If it does, I shall be one of those who will use it.

DR. J. HENRY CARSTENS, Detroit.—We do not strengthen the ligaments by resting them. We do not strengthen a muscle by resting it. The experts in physical and manual training

and prize fighters strengthen muscles by exercise. You must exercise these muscles if you would make them strong, and that is the reason why fixation temporarily holding the uterus up does not strengthen or restore the muscle except as Dr. Gilliam says. If he takes a silk ligature and brings the uterus forward and uses that as an artificial ligament, it is all right. If he uses kangaroo tendon, it will by and by become absorbed and disappear. Dr. Marcy, when he made his original investigations, claimed that kangaroo tendon remained and became a part of normal tissue, but later he took that all back and said it was entirely absorbed. If you use kangaroo tendon for the purpose of bringing the uterus forward and the kangaroo tendon holds it for a certain length of time, by puckering up you will find the whole thing goes back. You cannot restore the round ligament or keep the uterus in place permanently in that kind of way. You must make use of all of these methods. Every one of these operations are good, because every case is different. The operation must be adapted to the particular case in hand.

DR. HERMAN E. HAYD, Buffalo.—I have followed the work of Dr. Ill in this Association for many years, and what he has had to say about the Gilliam operation I heartily endorse, and particularly that part in which he speaks of doing a modified operation, sewing the lower flap of the ligament to the inner surface of the abdominal wall, practically bringing back the internal abdominal opening, the exit of the ligament, through the abdominal wall, an inch and a half, and in that way overcoming the possibility of a sac. With the original Gilliam operation the lower part of the abdominal cavity was divided into three distinct chambers, and if we have not had obstruction of the bowel, we are going to get it sooner or later if we make three cavities instead of one. There is no question about that. All so-called intraperitoneal operations are in the great majority of cases, I believe, reasonably satisfactory, providing we use non-absorbable ligature material. There is no question that Dr. Carstens is right in the statement he has made. I have had the uterus after a Gilliam operation fall back when I sewed the ligament with kangaroo tendon, and I always stitch it now with Pagenstecher linen. I am glad to have heard what has been said because I have discussed this subject for so many years and have written so much upon the Alexander operation, and I shall not permit myself or members of the Association, if it is possible, to lose all the enthusiasm we have had in favor of the Alexander operation for these new methods that have been coming out from year to year. Those of us who have done 100 or 200 or more Alexander operations in properly selected cases, and have seen the women bear two and three and even four children, the ligaments standing the test of pregnancy, and the uterus remaining in place, do not feel like giving up the Alexander operation. It is an extraperitoneal procedure. I will not, nor do I believe that other men are willing to do so. I



spoke to Dr. Ill, and I asked him if he had given up the Alexander operation, and he said he had, and it was that statement that brought me to my feet rather than to criticise the Gilliam operation. However, I maintain that he is not right, in an uncomplicated case of retroversion of the uterus to open the abdominal cavity. If this operation were done upon his wife or his sister, he could not tell how soon the patient was going to get obstruction of the bowels as the result of adhesive peritonitis. He does not know when he is going to get adhesions when he opens the belly wall. Perhaps you do open the peritoneal cavity slightly on two sides when you pull out the round ligament, but this opening is so small no harm results. You simply unshelve the ligament, and the peritoneum retracts around it, and inside of six hours the peritoneal cavity is closed with its adhesions. I cannot help but feel, gentlemen, that if we are going to accept these recent ideas, that it is not possible for us to differentiate between complicated and noncomplicated retroversions of the uterus in the great majority of cases, what is the use of a special society like this. I should feel ashamed if most men could not make a diagnosis of an uncomplicated case of retroversion of the uterus. True, sometimes it is difficult to make the diagnosis, and in a few cases we are perhaps going to fail to do so. In cases of noncomplicated retroversion, and there are lots of them, where there is no tubal or ovarian involvement, the Alexander operation is most satisfactory and I look upon it as an ideal surgical procedure in that restricted class of cases.

If we are going to accept recent ideas, that every tender spot in the right side is appendicitis or gall-bladder, then, of course we are going to open the abdomen and forget the Alexander operation, because we are operating to look at the appendix or gall-bladder or feel for a floating kidney, and not to correct a retroversion. I think we are getting crazy on this subject, and altogether too many bellies are cut open for diagnostic purposes.

DR. ROLAND E. SKEEL, Cleveland.—I would like to call attention to what I consider an inherent defect in all operations which shorten the round ligaments through the inguinal canals. The occasion for suspension of the kidney, suspension of the colon and suspension of the uterus arose from the fact that the human female assumed the upright position before the necessary supporting structures were evolved: A fact which I think we will all recognize if we will stop to consider for a moment and especially if we will reflect on the significance of retroversion and retroflexion in virgins and nullipara. If we look at a longitudinal section of the uterus we will appreciate that any operation which shortens the round ligaments through the inguinal canal carries with it the inherent defect that the pull upon the uterus is anterior to its midline, at the point of normal attachment of the round ligaments, and this continues the mechanical defect which was at least partially responsible for the original malposition. Whereas

if we split the broad ligament on either side, draw the round ligaments through this opening and stitch them together behind the fundus the uterus is thrown sufficiently forward so that intra-abdominal pressure tends to maintain it in its proper position.

This so-called Baldy-Webster operation contains one serious defect however in that if one fails to close snugly the opening in the broad ligament through which the round ligament is drawn a Littre hernia with strangulation of a nippie of intestine may occur. Such a disaster I reported as having happened to one of my patients and I have no doubt that unreported cases have occurred. In spite of this the operation is mechanically correct whereas all operations which draw the uterus from a point anterior to a median line are mechanically incorrect. If nature had done her work correctly in the first place we would be under no necessity for correcting malposition of the uterus or the kidney, but if we must let us not follow nature in her failures.

DR. FRANCIS REDER, St. Louis.—There is another serious feature in regard to the operation devised by Dr. Baldy, and it seems to me to be a serious feature with all of the methods where the artificial attachment of the broad ligament is made to the uterus. The operation of Mann and Tait has some risky features. In drawing the round ligament through an opening made in the broad ligament and attaching it posteriorly, there is great danger in attaching the ligament throughout above the center of gravity, particularly where the uterus is attached below. As a result, for instance, when during the menstrual function this organ becomes engorged, the attachment may either draw the uterus too far forward, or it will create a more serious condition than the one that existed before the operation. For that reason, it is not to be recommended that the artificial attachment be made to the uterine body proper.

The other operations to which we have listened are the more preferable ones, but we lose sight of the factor that we have to have some sort of support from below, and a proper perineum will give you the pressure that exists, which is such an important factor in the success of the operation in enabling you to give proper rest to the tissues after the Gilliam operation or any of its modifications. The Gilliam operation, as first described, has led me to operate on two cases for strangulation of the intestine, consequently it has made me very diffident, and unless I can do the operation in a modified way, I would rather not perform it at all on account of the serious consequences that may occur from intestinal obstruction.

DR. H. W. LONGYEAR, Detroit.—I did not have the pleasure of listening to these two papers, but I rise principally to support Dr. Hayd's contention in regard to the Alexander operation. I have had considerable experience with that operation, performed by the modified, blunt-hook method, as many of you know. I look upon it as the ideal procedure for correcting a retrodisplacement of the uterus of a noncomplicated character. There is no

question in my mind about its efficiency. It would seem unnecessary and foolish to resort to an operation, in the place of it, which, according to the previous speakers, is so dangerous, and which some of the gentlemen here are now using. These dangers have been pointed out by the advocates of the method, and different makeshifts recommended to avoid them. So, as I said, it seems to me a foolish thing to do an operation of that kind when the other can be done so easily and in such a simple way, leaving the round ligament in its normal position, performing its function in the most efficient manner and without danger to postoperative complications.

I wish to congratulate Dr. Hall upon his advance toward the correct point in this operation. He has now advanced the round ligament to the internal ring where it belongs. Some years ago I tried to make a convert of him to the Alexander operation, but apparently without success. My principal reason for recommending the shortening of the ligament in the inguinal canal is that it brings the ligament through the internal ring where nature meant it to come, and I see now that Dr. Hall is switching it over there, by dragging the abdominal loop through the internal ring by the Gilliam operation which he tells us he now uses.

DR. JAMES E. KING, Buffalo.—There are two or three points I want to speak of. The first one is in reference to the natural supports of the uterus. When we assume that the round ligament is one of the principal supports of the uterus in the non-pregnant organ, I believe that we are making a mistake. When we observe the uterus in its normal position during the progress of an abdominal operation, we cannot help but be impressed with the fact that in many instances where the uterus is in perfect position, the round ligaments apparently play but little part in holding so. Personally I believe that the main support in holding the uterus in proper position is the cellular tissue at the base of the broad ligament.

So far as the uterosacral ligaments are concerned they are no doubt factors in maintaining a proper position, and at one time I was an enthusiast in operations upon these ligaments in the correction of retroversion. The most satisfactory results, however, are obtained by the utilization of the round ligaments and of all the operations upon these ligaments the Gilliam operation seems to give the most uniform results.

There are one or two points in the technic of the operation which I have used which in my hands have been very satisfactory. The first is the use of the transverse incision. The second is an expedient that was suggested to me by having to reopen a case upon which a Gilliam operation had been done by another operator a year previous. On opening the abdomen I found the round ligaments, which had been pulled through the muscle and sewed to the fascia, spread out in a fan-like arrangement, so that the uterine, fascial and abdominal wall attachment formed a V. That suggested the advisability of uniting the uterine and abdominal

end of the ligament by a suture of linen. The ligament is thus shortened intraabdominally, it gives a well-formed ligament to be drawn through the muscle and it takes the strain, to a certain extent, from the part of the ligament united to the abdominal wall. With the transverse incision the round ligament is simply sutured to the underside of the fascia with the linen sutures that unite the fascia in closing the abdominal incision.

DR. ALBERT VANDER VEER, Albany.—I would like to say a word or two on these papers that have been presented. It warms the heart of an old man like myself, who was educated in the school of pessaries, to look back to the days of the use of Thomas pessaries and how they were used at that time in cases of retroversion of the uterus, and then observe what changes have taken place since that time. I was among the very first to open the abdomen for the purpose of relieving these cases of retroversion of the uterus. I have tried all the different operations. I have tried the operation of Polk, Mann, and other operations, but I have not followed the Alexander operation to a great extent. I must say, however, that of all the different kinds of operations, I have found the Gilliam operation to give me more satisfaction than any of those I had done previous to its introduction.

The paper of Dr. Ill is valuable for the reason that it gives us a summary of statistics, and it is upon such statistics as these that we must rely in drawing conclusions in reference to any particular method of operating.

As to the paper read by Dr. Buteau, I should like to read it and think it over very carefully, because I believe there are some points of considerable interest in it.

Dr. Skeel spoke of the erect position of woman. I believe in that very much. When I perform the Gilliam operation, I get the uterus up pretty well in front, and when that is done I do not have any serious complications. At least, I can truthfully say that these cases have not come back to me, and I can heartily endorse what Dr. Ill has said in his paper. Of the various operations, I have found the Gilliam operation to be the most satisfactory in my experience.

DR. WILLIAM H. HUMISTON, Cleveland.—I have had quite an extensive experience with the Gilliam operation, having performed over 300 cases. In all of the cases I reported yesterday of resection of the ovaries the majority were for retroversion of the uterus, and the Gilliam operation was done. I have had the privilege of examining seventy cases following confinement after operation. They were not all Gilliam operations, and in but one case did I find the uterus retroverted after delivery. The Gilliam operation is so easily performed and is so satisfactory, I do not see how it can be well improved upon in after-results. As to the Alexander operation, I did it for some time. In a great many of these cases I made the Alexander operation, but I did not relieve many of the patients, and in the majority of cases I

have had to go into the abdomen for other conditions I had to correct, such as resection of the ovary and adhesions, conditions one would not detect when he did the Alexander operation. The Gilliam operation gives you an opportunity of examining the appendix and other organs, so I do not have any use now for the Alexander operation. The Gilliam operation is perfectly safe, and you can do all the other work that is necessary to do with the abdomen open. In a great many cases you cannot make a correct diagnosis by bimanual examination especially where the patient has a thick abdominal wall.

DR. ILL (closing the discussion on his part).—The Adams-Alexander operation is ideal. I agree with Dr. Hayd about that, and I hesitated very much before giving up the Alexander operation. It was only after an extended trial with one of the other methods that I gradually left it, and did this modified Gilliam. Nobody can say that the peritoneum must not be opened with an Alexander operation. The uterine end of the round ligament presents severe adhesions between the peritoneum and muscular tissue, and in pulling the round ligament out of the peritoneum, this will often tear.

With regard to the operation described by my friend, Dr. Hall, it seems to me he makes an infundibulum of the peritoneum there. If you will take the trouble to look up the cases in which the Simpson operation was done, or for that reason, any operation which draws the round ligament through the internal ring, you will find that an infundibulum has been formed by the peritoneum, thus subjecting the patient to a subfascial hernia.

The operation on the uterosacral ligaments has been a decided failure, not only because it rarely keeps the uterus up, but because it produces sensitive and painful scars. Anyone who has done that operation repeatedly, and who has followed cases that have been thus operated on, knows that the uterosacral ligaments become sensitive, and coition and straining at stool, painful.

DR. BUTEAU (closing the discussion).—The statement has been made that the operation I have described will not hold the uterus in position. Experience or experiment is a better teacher than theory. I have tried it. I have tried it without prejudice, and I have had others try it without prejudice and it does hold. Now, I would ask you to fit your theory accordingly. As to the fact that the rest of a muscle does not develop it or strengthen it, I agree with you, but I do claim that rest is the first stage of developing any overstrained and relaxed muscle, and you cannot prove otherwise. I would like to refer you to an example I made use of in my paper, and ask any doctor if in the treatment of a broken compensation of the heart from dilatation he would ask the patient to continue to exercise *more* in order to cure or help the condition of the heart. Does he not need to rest the heart for a time and later begin to exercise it systematically? In the case of overstrain of the ciliary muscle, would you ask a man to take his glasses off and



to use this muscle more? Rather would you not urge him to put glasses on, and perhaps colored glasses, and tell him not to use his eye, but give the muscle rest, and ask him to continue it? The first stage, therefore, of helping an overstretched muscle is rest, and then function afterward.

Dr. Alexander in his earlier operations, I do not know what he is doing now, advocated the use of pessaries for three weeks after his operation, and at the end of that time found the pessary was no longer necessary as the round ligaments would hold. The operation for retroversion is not primary, it is a secondary affair and is incident to something else. There is not a constant pull upon the round ligament if you have corrected the pathology, and it is not intended by nature that there shall be a constant pull on the round ligament. If you restore the uterus to a normal position, you have a condition very much as nature intended without a constant pull upon the round ligament.

DR. GOLDSPOHN.—How many of your cases have stood the test of pregnancy?

DR. BUTEAU.—I am glad you asked that question. Three or four years ago a young lady from Seattle presented herself at my office, who had undergone an operation for a possible indirect inguinal hernia, and during the operation evidently both round ligaments were cut because on opening the abdomen I found them severed and the cause of the retroversion. I then picked up the round ligaments and found them greatly retracted within an inch and a half of the attachment to the uterus. Both had been severed, and as a result we had retrodisplacement of the uterus. I took these round ligaments and attached their cut ends with silk, in the form of a mattress suture, and anchored the distal ends of the sutured ligaments to the upper part of the internal ring of the abdominal wall and continued the suture, subserous parallel to the ligaments, to each horn of the uterus, thus making two artificial ligaments of silk and then sent her home. She became pregnant, and about eight months afterward I delivered her of a child at full term without any trouble. I saw her six months ago and the uterus was in good shape, in a normal position. This operation holds the uterus in position I think, because the round ligament has the assistance of the utero-sacral ligament, and in the operation that I have discussed this morning it is thought that it gives both ligaments rest and support for a time. I do believe this is so. If the uterus is in a normal position, there is no constant tension put upon the round ligament. It is only possible when there is straining, when there is an overdistended bladder or rectum, or something of that character. If you remove the pathology in the pelvis and keep the uterus in position for four or five weeks, I claim that with this operation it will stand. I have tried it. It does stand. It may not be all that I feel it is. Often surgeons who practise a certain operation become intensely interested or may be overenthusiastic in regard to it. I have asked others to try



out this operation, and I have not been discouraged by their reports. I could report fifty cases in the practice of others, and I wish you would consider the operation seriously, and apply it in place of those operations that are not quite satisfactory to you. It, at least, will act as a reenforcement to the plastic work of other operations upon the round ligament, if you prefer any other method.

## SOME DIAGNOSTIC PITFALLS IN ABDOMINAL SURGERY.<sup>1</sup>

BY

E. W. HEDGES, M. D.,  
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A NOTED preacher has said that prayer is autobiography. Be that as it may, in praying for indulgence to-day I confess that most of the blunders I am to warn you against are those I have made myself, some of them many times over.

The most important part of surgery is diagnosis and it is the hardest part to master. He who professes never to err in his surgical diagnosis does not know the truth. Some of the ablest men in the country often put question marks after their operative notices and the rest of us would be less frequently humiliated if we did the same. The best men are not those who make no mistakes but those who make fewer than their fellows. Last fall at the Congress of Surgeons of North America at Philadelphia I heard one of the most famous diagnosticians in the country lecturing in conjunction with one of our ablest surgeons declare to a crowded amphitheater, having on its benches Drs. Mayo, Ochsner and Murphy, that a certain border-line case was undoubtedly pyloric obstruction and he gave convincing reasons why it could be nothing else. The surgeon concurred in the diagnosis, opened up the abdomen and three fingers slid through the pyloric orifice with the greatest ease. This was a bit embarrassing but the next case was confidently declared to be one of gastric ulcer, for the man had vomited pints of blood at various times and had all the classical symptoms and both the famous men proved it conclusively. Again, the abdomen was opened and there was no ulcer but a cirrhotic liver. Another well-known surgeon undertook to show us his method of doing an hysterectomy but found on operation that he had a normal uterus with a large ovarian cyst to deal with. When we go to some great

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

clinic and see these things, and we see them whenever we go, we are greatly comforted, and at the same time our judgments of others grow gentler and our bump of self-esteem tends to diminish.

A few of the mistakes we are likely to make in doing abdominal surgery we will now consider.

Beware of diagnosing cholecystitis in the young. They rarely have anything the matter with their gall-bladders. When a boy or girl complains of pain in that region, with fever, tenderness on pressure and rigid muscles, look out for central pneumonia with diaphragmatic pleurisy. Watch the fever. It will be more regular and less of the intermittent type, the pain will be steadier and while there may be no cough nor increased respirations nor any pulmonary symptoms, just wait, and wait patiently for even five or six days if need be, and then the chances are the physical signs of a pneumonia will appear.

In this connection it may not be amiss to call attention to the danger of confusing a beginning pneumonia, especially in children, with appendicitis. The lower intercostal nerves have branches which run down to the skin and muscles of the abdomen, and irritation within the chest is felt in the terminal filaments of these nerves in the region of McBurneys' point giving rise to pain, tenderness and rigidity in that region. When pneumonia is present there is apt to be a higher fever at the beginning than in appendicitis, increased respirations and a higher leucocyte count. The main point to bear in mind is always to make a careful examination of the chest before diagnosing appendicitis in children.

It would take us far beyond the time limit of this paper to attempt a complete differential diagnosis of appendicitis, but there is one condition that I believe it is impossible to diagnose from the chronic type of the disease and that is the so-called Lane's kink. The symptoms warrant operation, however, and if we will always examine the ileum just before it enters the cecum and loosen any bands that may constrict it we will have more uniform success in our results. We have all taken out so many healthy appendices in the neurasthenic and probably will do so again, that we can afford to spend a moment considering this topic.

We know that there is no symptom nor set of symptoms under the canopy of the heavens that nervous women may not get. Nearly every one of them knows the location of the appendix

and the cardinal symptoms, and autosuggestion does the rest. Even those of us who have phlegmatic Dutch dispositions recognize the power of the mind over the nerves. By concentrating my mind and willing to have a pain come in my finger I can very quickly make it ache so hard that I have to rub it briskly to stop the pain, and I can conjure up a real toothache or toeache in the same manner. Much more a morbid woman under the dread of appendicitis but with no intention of doing so, sets going a train of nervous influences which will deceive not only herself but the surgeon as well unless he is most careful.

Pain over the region of the appendix will be present, aggravated by motion, tenderness on pressure and rigidity and sometimes even a degree or so of fever. Of course it is the subacute type that we are liable to confuse this with. But a careful examination of the abdomen fails to show the restricted respiratory movements on the right side that we get in the real thing. We have not the same anxious expression of the face and if the patient's attention is sufficiently diverted we can palpate the organ without eliciting complaint provided we have warm hands. This seems like a small point but cold fingers irritate the terminal nerve fibrils in the skin and these convey the irritation to the deeper branches in the rectus and that muscle immediately becomes rigid, when with warm hands no such reaction would occur. Above all get the nervous history in suspected neurasthenic cases, and once convinced there is only a nervous pain present be brave enough to refuse operation, for removing the appendix will not remove the pain.

Before leaving the subject of appendicitis there is one class of cases that to me has been most baffling to diagnose. I refer to the disease as it occurs in young children from two to six years of age. While writing this paper and while my mind was on the subject of appendicitis, I attended a boy of six years for three days, examined carefully several times for any evidence of the disease and made the diagnosis only at the end of that time when the inflammation had made great progress. He had initial vomiting, transient pains through the abdomen, mostly in the left hypochondriac region, absolutely no tenderness on pressure, no rigidity, passed large quantities of mucus following a cathartic, temperature at no time over 100°. The pulse was rapid, running around 120 but all this time no tenderness whatever over the appendix. But in twelve hours after pain first appeared in the appendix, accompanied with tenderness and rigidity, the

appendix was found full of pus, large bands of lymph were binding it to the intestinal walls and the omentum in its protecting care was firmly adherent. There must have been inflammation in the appendix long before any of the cardinal symptoms appeared.

And this is not the first time I have been deceived in precisely this same way. Catarrh of the colon with the passage of large quantities of mucus should not divert us from a rigid examination of the appendix. Overeating, with gastric and intestinal disturbances in its wake, is so common in children that we are prone to overlook a graver condition back of them, but speaking for myself I cannot always diagnose the appendicitis even when I am looking for it. I believe the absence of diarrhea in these cases should make us strongly suspicious of the appendix.

As for the digestive symptoms that come from chronic appendicitis, their name is legion. Stomach specialists would lose half their trade if every chronically inflamed appendix were removed, and numerous patients would be spared the discomfort of the stomach tube, the annoyance of swallowing sundry cunningly devised dippers with their long and supposedly tell-tale strings, and the vexation of living on a diet which affords them no relief. In every case of intractable dyspepsia unless we can satisfy ourselves as to its cause we should suspect the appendix even though no marked local symptoms have appeared in that region.

Reverting to the subject of neurasthenia, just a word about floating kidneys. We frequently find these two conditions in the same patient and we used to jump to the conclusion that the movable kidney was the cause of nervousness and we hitched the kidney fast enough but the nerves kept up their antics just the same. I am afraid to give any estimate as to how many women have movable kidneys. The statistics I have seen are only confusing from the vast variety of percentages recorded. But I do venture the opinion that the majority of women who have movable kidney have no symptoms whatsoever arising from this condition. If in one of these cases there are severe paroxysms of pain due to kinking of the ureter or of the pelvis of the kidney, and during these attacks of pain or just afterward marked urinary changes occur then we are warranted in fastening the kidney. Morris has recently called attention to the valuable diagnostic point that when a floating kidney is causing trouble there is a splint-belly rigidity of the muscles overlying the organ,

on the same principle that the rectus protects an inflamed appendix.

It seems only reasonable that a moderate amount of nephrop-tosis should be harmless, just as a moderate sagging of other viscera gives rise to no unpleasant symptoms. We hear a great deal in these days of visceroptosis, and bismuth paste and *x*-rays have made possible a fairly accurate diagnosis of these conditions, yet I believe it is a fashionable fad to assign all sorts of symptoms that we can't easily explain otherwise to the sagging of a colon or the descent of the stomach. If we used up some of our gray matter we would often find a scientific explanation more in accord with the facts.

Not that *x*-ray findings are not valuable aids to diagnosis. But it is when those findings are positive that they are of greatest value and it is most unsafe to abandon a diagnosis because we can't prove it by the *x*-ray. For instance, I have seen gallstones beautifully nested in the gall-bladder in an *x*-ray picture but they had lime salts in them. The common type of bilirubin and cholesterin varieties would not show. Likewise in diagnosing stone in the kidney, ureter or bladder, a pure uric acid concretion would not show at all while a phosphatic stone or one containing oxalate of lime would cast a dense shadow.

I am not prepared to say that Dr. Cole, of New York, is wrong when he claims that he can diagnose gastric ulcer and beginning carcinoma of stomach with his weird light, but I am prepared to say that I have had my own diagnosis of pyloric ulcer upset by the *x*-ray, even when I could back it up by such symptoms as persistent hyperacidity, pain coming on two hours after food and lasting for two or three hours, relieved by taking alkalies or ingestion of more food, and accompanied by fermentation and exquisite tenderness over a spot in duodenum.

Not only did the *x*-ray upset my diagnosis but it gave a picture of general adhesions between stomach, liver, colon and omentum, showing pyloric narrowing from bands, and operation with subsequent recovery following the loosening of the bands, has proven the correctness of the diagnosis. I believe that symptoms of gastric ulcer with pyloric stenosis are simulated oftener than we think by adhesive bands flattening out the duodenum, these same bands originating from a gall-bladder infection or even from as remote a source as the appendix.

In every case of intestinal obstruction thoroughly inspect all the hernial outlets. Frequently a small knuckle of gut, so small

as to escape detection from a casual look, gets caught in one of these places, gives no pain at the point of constriction perhaps, but causes epigastric distress, and unless we examine carefully the hernial exits we may mistake the site of the trouble altogether.

Many a case of pelvic tumor has an illuminating light thrown on its character by the use of a catheter. Never be afraid to use this important diagnostic and therapeutic instrument.

We are constantly reminded in these days of the need of remembering the decalogue. As a matter of fact we all know those ten laws and yet from the pulpit and the platform and the press we are told how we fail to keep them. There are certain diagnostic points, among them these I have presented to you to-day, that are known to us all and yet it does us no harm to be told them again. Every golfer knows he should keep his eye on the ball, yet if his caddie tells him to do it at about every second stroke he makes a better score. It is in the hope of improving our score that I have presented this very imperfect and fragmentary account of some diagnostic pitfalls in abdominal surgery.

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#### DISCUSSION ON THE PAPER OF DR. HEDGES.

DR. J. HENRY CARSTENS, Detroit.—The author of the paper ridiculed the examination of the stomach by the silk thread, but I think it a valuable means for diagnosis. When you have a case of ulcer of the stomach or duodenum, you can often verify the diagnosis and locate the site of the ulcer by noting the position of the blood stain on the silk thread.

DR. WILLIAM EDGAR DARNALL, Atlantic City.—Dr. Hedges has called our attention to some valuable points in his paper. They are practical points. It is quite important to make a differentiation between pain and tenderness. Tenderness is perhaps a little more reliable than pain as a symptom for locating the trouble. We know how elusive pain is. Human nature is the same all over the world. Up to the time we became surgeons we felt perhaps very much as these patients do, namely, that the point at which the greatest pain is felt should be considered as the location of the trouble. It took us a long time to unlearn that and to be impressed with the fact that oftentimes we have a series of symptoms that go to make up a certain condition, and the location of the pain may be the least important of the syndrome of symptoms we have. I think sometimes we are inclined to focus our minds too much on one part of the patient's anatomy and forget the balance of the body; in other words, pain from certain types of pneumonia in children, as Dr. Hedges has referred to, may become located in the region of the gall-bladder



or the appendix, but we are apt sometimes, particularly in the beginning of our experience, to forget to look anywhere else for trouble but in the region of the gall-bladder and the appendix, or where the greatest pain may be found.

The doctor's paper recalls a case I had a few years ago. A gentleman came to Atlantic City from the state of Kansas; my associate saw him in the middle of the night with what he presumed was an ordinary attack of enterocolitis. The next morning pain was located in the left kidney and continued to stay there. He had no symptoms on the right side from his diaphragm down to his pelvis. He had no pain or rigidity. He had a history of kidney colic. He had pus and blood in the urine on the left side, and had a leucocytosis. We felt that he must have a kidney infection, a pyelitis, or something of that kind. We urged him to go to the hospital which he refused to do until the last moment. After he got there, we found on opening him up a perforated appendix with the tip to the left side of the mid-line, buried in a puddle of pus and walled off by the omentum. We found the kidney perfectly normal. I cite this case to show how elusive pain is, and how far astray we may go if we depend on it alone. A man may have appendicitis under certain conditions and have pain anywhere in his whole abdomen.

DR. WILLIAM SEAMAN BAINBRIDGE, of New York City, called attention to Lane's kinks in relation to cases of appendicitis in which removal of the appendix fails to effect a cure. Four years ago he went to London with the determination of investigating some of the seemingly absurd and extreme statements made at Guy's Hospital with reference to Lane's kinks. Each year during four successive visits, he has had the opportunity of examining many of Lane's cases, of studying his serial skiagraphs showing the bismuth in its transit through the intestine, and of following thirty of these cases year after year. Lane's work, in his opinion, explains some of the cases in which the intestinal symptoms continue after removal of an appendix which was not very seriously involved. The appendix may be removed, but if the gut is kinked, as described by Lane, intestinal stasis and its concomitant symptoms are the result. More and more attention is being devoted to the possibility of the existence of these kinks, and to the study of their etiology and treatment. Whether Lane's theory of their formation be correct or not, undoubtedly he has demonstrated by his cases and pictures the existence of such conditions.

According to Lane's theory, the weight of the abdominal viscera tends to cause, in the upright position, a ptosis of the heavier parts of the alimentary canal, notably the stomach, when it is filled with food, and the large intestine, when it is loaded with feces. With the dropping of the viscera there is dragging of the mesentery, resulting in the formation of thickened bands, sometimes referred to as "evolutionary adhesions," the function of which seems to be to support the intestines and

to prevent them from dropping downward. The unequal strength of these bands in different parts leads to unequal support throughout, and as a consequence the bowel is held up firmly in some points and allowed to sag in others, the result being angulation or kinking at the point of support.

The perfectly natural outcome of this condition of affairs is obstruction of the lumen of the intestine at the point of the kink, with damming back of the contents, and general slowing of the drainage of the canal. Reabsorption and autointoxication are the inevitable results, leading, in Lane's opinion, to a general lowering of the resistance of the body and the concomitant increase of susceptibility to various disease.

The points of predilection for the formation of these kinks are: (1) in the third part of the duodenum, at the commencement of the jejunum; (2) at different points along the terminal coil of the ileum, "Lane's Ileal Kink"; (3) in the ileocecal region, including the appendix; (4) in the region of the hepatic flexure and the first part of the transverse colon; (5) at the splenic flexure; (6) at the sigmoid loop; (7) in the rectum.

Adventitious adhesions, or pseudo-kinks, are not to be confused with the so-called Lane's kinks.

The treatment of these conditions varies with the location of the kink and the degree of obstruction.

DR. HUGO O. PANTZER, Indianapolis.—With regard to cold fingers, in my estimate, these interfere with making abdominal diagnosis to an extent almost to rule out the man having such. Delicate perception is impossible with cold fingers; and then, the cold touch on the abdomen induces muscular rigidity of the abdominal wall. Gross pathology only can be elicited with cold fingers.

Regarding the cases referred to by Dr. Hedges, when appendicitis was clinically manifest, and yet at operation appendicitis was not found, I would contend that many such cases are yet due to appendicitis. They will reveal pericecal and periileal membranes and bands, which are logically traceable to lymphangitis produced by subacute, chronic appendicitis. This is a form of appendicitis that ends frequently in partial or whole obliteration of the appendix, commonly without developing an acute crisis, such as calls for immediate operation. But in these cases, we may find the entire mesenterium contracted so as to draw and plaster the appendix to the wall of the cecum, contracting the adjacent cecum, and drawing the ileum out of place, angulating or twisting it, and forming the characteristic Jackson's membrane over the cecum. In such cases the posterior cecal wall is found contracted, drawn high up, and adherent to the parietes, while the anterior cecal wall is found lengthened out, extending often down to Poupart's ligament. These cases form a class distinct from that due to enteroptosis. Often the cecum is bound down by a broad band that plasters it against the lateral pelvic wall. It forms a sausage-like organ, hugging the

pelvic bone, and passing along Poupart's ligament down to the symphysis. With such displacement and distortion of the cecum, obviously, the feeding arm of the ileum becomes drawn, twisted and dislocated. Gentle touch will reveal these conditions before operation; the ileal loop being indicated by the tenderness and bloating, extending to, and at times beyond, the umbilicus. The full release of these adhesions and membranes, will make for return to normal position and mobility of these organs. A warm touch soon after operation reveals that the cecum has receded to its normal position. This return to an approximately normal position may be adduced as evidence of the inflammatory nature of the displacement. Such recession would not occur, if congenital ptosis were the sole factor of the production, for which contention is made by some writers. Simple transverse cutting of these inflammatory membranes should suffice. There is no need to separate them from the cecum or ileum. Being scar-like tissue they will retract of themselves, and this occurs with less traumatism and liability to adhesions, than where the surgeon attempts it. I have never found resection of the intestine indicated by such condition as has been found and done by Lane, Jackson, and others.

DR. MILES F. PORTER, Ft. Wayne.—I want to emphasize the differentiation between pain and tenderness. Tenderness to the surgeon usually means something definite. It means in the abdomen usually a pathologic condition at the basis of which there is an infection. Pain may mean half a dozen things.

I would like to make another point: If we would stop looking at so-called pneumonia as a local infection of the lungs, and look upon it as a general septic process which may manifest itself in any tissue of the body, we will not be so often caught up in our diagnosis between abdominal and so-called lung lesions. The fact of the business is that in a great many of these cases of so-called pneumonias simulating appendicitis, we do have a pathologic lesion in the abdomen and it is due to the pneumococcus. It simply means that you have something more than a pneumonia.

I would like to call attention to another fact. Some ten years ago I read a paper before the American Medical Association on the association of colitis, constipation and appendicitis, and I called attention to the fact that a great many cases of appendicitis are consequent upon or are the result of primary infection of the colon. Let me call attention to one other point, and that is, that not every lesion in the lower part of the abdomen or in the right lower quadrant of the abdomen is due to a lesion of the appendix, nor are the suppurating lesions necessarily the results of perforation. Within the last ten days it has been my fortune to make autopsies in two cases of localized suppurating peritonitis, one in the right and the other in the left lower quadrant of the abdomen, in neither of which was there involvement of the appendix, and in neither one of which was there a perforative

lesion of the bowel, but in both of which there was a marked colitis.

DR. FRANCIS REDER, St. Louis.—One of the most interesting allusions Dr. Hedges made in his paper is what Dr. Porter has dwelt upon, namely, abdominal conditions that are secondary only in a sympathetic way. If such a patient falls into the hands of a surgeon, who ignores that branch of medicine belonging to the internist, he is going to lose his appendix. The abdominal symptoms, strange to say, manifest themselves somewhat earlier than the clinical picture which gives us the classic symptoms that will permit of the diagnosis of either a pulmonary lesion or a pleuritic lesion. Dr. Darnall is correct in stating that in cases of appendicitis the patient may have pain almost anywhere. It is the duty of a surgeon to make a diagnosis, whether he be right or wrong, before he enters the abdominal cavity. He must have a diagnosis as a basis upon which to work. In the chronic form of appendicitis we sometimes have a symptom-complex which appears to involve every organ in the abdominal cavity. We meet with patients who are not sick enough to be in bed, and not well enough to be at work. They are gradually drifting into a state of invalidism. How is this form of chronic appendicitis to be diagnosed? There is one point well worth remembering. This point is not extensively known. It can be brought out only by rectal examination. By introducing the finger into the rectum and through the valve of O'Beirne, gentle traction, while the finger is swept about the region of the right iliac fossa, will cause pain of characteristic value. No reflexes will be elicited when the finger is swept toward the left iliac fossa, unless a pathologic lesion is present.

## HOW DOES LAPAROTOMY CURE TUBERCULOUS PERITONITIS?<sup>1</sup>

BY

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THE review of medical literature on tuberculous peritonitis shows that it was first known in 1825. The malignant appearance of the full-blown disease found at autopsy gave it the significance of an invariably fatal condition. Particular clinical interest for this disease did not develop until much later: when cures were observed following laparotomy undertaken on mistaken diagnosis. Spencer Wells reports such an occurrence of the year 1862. A woman, aged twenty-two, was operated for presumed ovarian tumor. Tuberculous peritonitis was found.

<sup>1</sup>Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists, Toledo, Ohio, September, 17-19, 1912.

The fluid within the abdomen was discharged and the abdomen closed. Contrary to expectation the patient got well, and was known to live twenty-five years afterward. Koenig's report, in 1884, of four cases treated by laparotomy with three recoveries, and his advocacy of this measure in all such cases, aroused general professional interest.

A great mass of clinical and scientific observations has since then been accumulated. Much information pertaining to the clinical varieties of the disease and their varied course; its spontaneous cure in a large percentage of cases; its curability by surgery, and by internal and hygienic measures; its complication by the same disease in other organs, and by other diseases, etc., has been developed. But there is still great diversity of opinion on many points. Especially as yet, there has been no satisfactory explanation offered why laparotomy should exert curative influences over this form of tuberculosis. While there are those who still contend that the internal (*i.e.*, nonsurgical) treatment of tuberculous peritonitis yields the best results, and, some few advocate this plan of treatment, it is to-day generally conceded that certain kinds of tuberculous peritonitis shall invariably be treated by laparotomy; that its employment in other kinds of cases at least must be favorably considered; and that in certain other forms of the disease laparotomy shall not be attempted, on account of the almost invariable fatal result. The first twenty years following Koenig's publication, brought out many statistical reports, variously construed by the surgical or internal bias, or the limited personal experience of their respective authors; and without as yet settling many moot points. Quite in contrast with this expression, is the rather non-committal character and paucity of the literature on this subject appearing during the last decade. For the purpose of this paper, it is mete to take up singly the moot point of how a laparotomy effects a cure in tuberculous peritonitis.

The writer was in Germany when Koenig's publication appeared and became the subject of interested discussion everywhere. He attended Koch's course at the Royal Hygienic Institute at Berlin, and was present at the International Medical Congress, in 1890, when Koch made his epochal announcement of his discovery of the tubercle bacillus, and also of a remedy, tuberculin, which, given to the guinea-pig produced immunity against tuberculosis, and cure in the same animal where the disease preceded the administration of the remedy. It was the privilege

of the writer, in 1893, to report the first two cases of this kind in Indiana, designedly treated with laparotomy. Naturally this subject has always held his great interest.

The explanations variously offered of the relief or cure obtained by laparotomy, were singularly unsatisfactory, as evidenced in the antithetical expression often heard, that the method of cure is without its parallel in medical history. The admission of air to the abdomen, the introduction of various medicaments, the handling of the intestines, the exposure of the opened abdomen to sunlight, and other procedures in addition to the laparotomy, each and all, are untenable in view of their absolute inefficacy in the presence of the same disease in other parts or organs of the body.

The writer early was impressed with the clinical observation, that most of these cases develop a rise in temperature which in several distinctive phases is unlike the febrile temperature of an infection after laparotomy. The immediate effect upon the general condition of the patient undergoing this pyrexia, and the ultimate results in these cases vary greatly from the effects of the ordinary postoperative infection. The temperature observed in these cases arises variably from eight to thirty hours after operation, oftenest about the early time. In other words, this fever arises earlier than the fever of infection following an operation. It is of transient duration and marks a stimulating, rather than a depressing, effect. The shorter duration of this fever and the relative absence of the bad effects attendant upon an infectious disease, are remarkable. The symptoms of a local reaction about the parts affected with tuberculosis and handled during the operation is rather more transient and less severe, than where it is owing to a postoperative infectious activity. The ultimate condition and result are striking occurrences. These patients make remarkable speedy and, withal, often permanent recoveries. This is in impressive contrast with the low vitality and lengthy morbidity of these patients present before the operation. The course of these patients, when compared with the slow, imperfect and often relapsing course of similar patients treated internally and hygienically, is too notable to go without consideration or comment.

It seems reasonable to associate these effects of a laparotomy for peritoneal tuberculosis, *with the active absorption, from the abdomen, of fluids engendered by the disease itself.* The thought lay near to regard such fluids found in the abdomen of these cases,



as consisting of *an autogenous tuberculin, associated or not, with antibodies.*

The more definite solution of the multiple and diversified problems associated with this question, must be left with laboratory and experimental research. It is entirely beyond the domain and capacity of the clinician. It may be hoped that, some day, we shall be able to determine in advance the quality of the fluid present in a single case, and so to modify the quantity or the quality of this therapeutic agent, as to enable us eventually to prevent the deaths and imperfect results otherwise attending upon the treatment of such cases to-day. We may hope even some day to avoid the incurrence of laparotomy for the cure of this disease. It seems possible that the fluids thus obtained may be utilized ultimately in the treatment of all sorts of tuberculosis in any part or organ of the body. Further mootings of these hopes shall here be discontinued.

The writer has long since entertained the convictions here expressed. They have been, in the course of the years, expressed by him repeatedly on occasions of medical meetings, without finding echo.

A case of unusual interest came under treatment in 1907. Its history seems particularly instructive, and illustrative of the reaction following laparotomy in these cases. Sufficient time has elapsed to warrant its publication.

Miss M. M., Irish-American, aged twenty-three, had been weakly for several years. During the last years a cough with characteristic expectoration, and the microscopical finding of tubercle bacilli and the chest conditions present, had led to the diagnosis of pulmonary and pleural tuberculosis. Dysmenorrhea, with pelvic pain and abdominal tenderness had been present a long time, and latterly there appeared recurring attacks of colic and burning, in definite localities of the abdomen. July 16, 1907, patient was seized with acute colic and persistent vomiting. Purgatives given by mouth and by rectum during the succeeding five days failed to discharge the intestinal tract. I was called, by the attending physician, Dr. James H. Brill, late in the evening of July 21, 1907. Patient presented the general characteristic evidence of chronic phthisis. Both apices and the lower left lung and pleura were found involved. Acute attacks of colic came up at short intervals, during which the emaciated and somewhat distended abdominal walls showed in distinct outline loops of small intestine in active peristalsis. The suffering from this source was accompanied with coughing and retching. The miserable general state and the several grave local conditions of the patient marked an extreme, not to say hopeless, condition.

Pulse was weak, 140-160. Temperature 102° F. An operation seemed worse than useless. Yet, the immediate suffering of the patient called for relief. Patient was at once transported to the St. Vincent's Hospital. Chamomile tea, sodium chloride, sodium salicylate, and spirits of camphor were given by rectum every four hours during the night. Operation at 8 A. M. the following morning. Dr. Brill present. One H. M. C. Abbott tablet was given one hour before the operation; small quantities of ether, during the same. Good narcosis. Medium incision below the umbilicus, revealed general, parietal and visceral tuberculosis. Fair amount of turbid exudate. Small intestines, at three points, and also involving the sigmoid loop extensively, were matted together by dense fibrous adhesions. The adhesions required cutting by knife and scissors for their relief. The adjoining mesentery at different parts was intimately involved, making separation difficult, tedious and at times seemingly impossible. The tubes, broad ligaments, appendix and cecum showed tuberculous changes in marked degree.

Patient's general condition immediately after the operation, relatively good. No shock. There was no vomiting during the operation. Five hours later patient was found smiling, without pain or distress, quite in contrast with the previous condition. No vomiting or nausea after operation. Rectal feeding and medication after operation as during preceding night. Rectum soon became irritable, owing to frequent diarrheal discharges, and enemata had to be discontinued. Water was given by mouth after first six hours, other fluids, after first twelve hours. Digestion good. Temperature during this day varied between 99.5° and 102° F. Pulse at first 140-150, next day under strychnine, about 120, less feeble. General condition very fair. During second day, involuntary rectal discharges. Later in the afternoon flighty mind and great physical restlessness, without complement of pain. Temperature 103° F., pulse 120-130, rather full. Urine in fair quantity; albumin positive. A few hours later patient became maniacal, and shortly after, at 7.30 P. M., general convulsions of about ten minutes duration occurred. When I reached patient at 8 P. M., the convulsions had ceased and coma was present. Temperature by axilla 102° F.; pulse bounding; skin moist; pupils contracted, equal, some response to light. There was no evidence of a localized cerebral involvement in the convulsive movements, nor during the coma. Diagnosis: toxemia from abdominal absorption. I had never before observed convulsions in such cases. The toxic manifestation in this instance by far exceeded anything I had met before in similar cases. But, relying on my previous observation in such cases, prognosis was at once declared; not without a fair hope. I should here report that the Catholic priests and sisters, and the relatives of the patient present at this time, received my statement of hope with undisguised incredulity. In the morning of July 25, the patient was quiet, rational, though weak. Temperature 100.2° F.,

pulse 100, less bounding. Skin moist; free diuresis. The subsequent recovery of this patient at the hospital during the next three weeks, was uneventful. Coughing and expectoration were greatly lessened at once. Patient was able to feed remarkably successfully, when her previous condition was considered, and after her discharge from hospital went back into the hands of her former medical attendant. Creosote and cod-liver oil were given internally, and hygienic measures were carried out with fair vigor, though patient's peevishness and self will, acquired by former invalidism, left much to be wished for. Great definite general and pulmonary improvement followed early. I did not see patient again until Feb. 4, 1908. She looked infinitely improved. Nutrition was fair-to-good. No more pulmonary symptoms, though occasional pain and tenderness to pressure over lower left chest were complained of. Examination of chest revealed no evidence of an active process. Menses, before operation painful, since had been painless, until last flow, which was very painful. Examination revealed fecal impaction of rectum and entire colon. Moving the uterus, gave rise to pain. Castor oil daily. Examination one week later, revealed thickened and tender tubes; boggy and tender sigmoid and cecum. Temperature at 4 P. M. 99.3° F. Lungs negative, except as to evidence of obsolete processes. Patient had relaxed in her efforts as had her family in their attention to the patient. The attending physician had not been consulted for a long time. Hygienic treatment and creosote had been discontinued for some months.

*Diagnosis.*—Tuberculosis of tubes, cecum and appendix. Operation was advocated, but was not favorably entertained by the family. Referred back to Dr. Brill. Creosote and hygienic measures were again taken up.

During April, 1909, more than one year later, patient returned. Fair general condition. No pulmonary symptoms. Menses painful, too free. Constipation, requiring medication. Much dragging and heaviness in pelvis. Uterus enlarged, soft, tender; tubes increasedly thickened. Cecal region doughy, tender and painful on pressure.

*Diagnosis.*—Cecal and tubal tuberculosis. Operation insistently advocated.

Operation at St. Vincent's Hospital, May 27, 1909, twenty-six months after first operation. Dr. Brill present. Two H. M. C. Abbott tablets, two hours and a half hour respectively before operation: good effect. Chloroform in small quantity at intervals. Good narcosis. Incision through old scar in median line. Wound by former operation perfectly healed. A loop of small intestine, 20 inches long, was found abnormally adherent to its own mesentery, was twisted, in part, so as to encroach upon its lumen perceptibly. These adhesions were firm, requiring knife and scissors for their release. A few white nodules, some the size of a split pea, consisted of calcareous matter were present as remnants from the former tuberculous process. The left tube, and

the appendix vermiformis adhered to the adjacent intestine. Tubercles were strewn over all these organs, including the upper part of the uterus and cecum. The uterus was enlarged to the size of a four weeks' pregnancy; of relatively firm consistency. The tubes were indurated, irregularly nodular. Both tubes were resected in wedge form from uterus. Free bleeding occurred from all surfaces. Evidently nature was well on the defensive. The left ovary contained a cyst the size of a pigeon's egg; ovary removed. Right ovary was in good form. The appendix was freed from adhesions and ablated. Uterus was ventrofixed. Abdomen closed. Curetage of uterus yielded few scrapings. Patient in good condition. Mild but definite febrile reaction within first twenty-four hours, attended by little malaise. Un-eventful recovery, but for acute pelvic congestion and pain at next menstrual period, while at hospital. Small intrapelvic hemorrhage was diagnosed. June 20, 1909, patient left hospital in very good condition and cheer. The immediate subsequent history very satisfactory.

June 24, 1912 (five years after first, and three years after second operation), chest symptoms have not revived since first operation. Patient is no longer vulnerable to colds, as was markedly the case before first operation. Menses every one and one-half to two weeks. Flows less free; ordinary menstrual molimina accompany each flow, together with some sacral and occipital pain. Stomach weak at times. Bowels regular with bran-bread, without such, not. Patient has grown in height about one and one-half inches. Weighs more than she ever did before. Good color, good spirits. Creosote, Fowler's solution and compound tincture of cinchona were given. September 3, 1912, sister reports patient doing exceptionally well. Last complaints have practically disappeared.

*Epicritically* considered, this case presents many interesting points. A few may be noted here. The excessive toxemia with convulsions following the first operation, in the light of the subsequent course, may be regarded as having passed without leaving any blemish. The pulmonary and pleural disease was cured and became obsolete with remarkable rapidity and definiteness. All the vegetative functions, previously lagging, revived at once, like the fields, by a decisive rain after prolonged drought. White and Van Norman (*Archives of Internal Medicine*, vol. ix, No. 1, 1912) in an article entitled "The Determination of Individual Dosage in Tuberculin Therapy," say: "The principle in which we believe in tuberculin therapy is, that the object to be obtained is the *reaction of the body cells which results from a sufficient dose of tuberculin*, and not the tolerance which comes from gradually increasing dosage." Certainly "the reaction of the body cells" even after this excessive dosage was dis-

tinctly marked and helpful. It may be that larger doses of tuberculin, than ordinarily given, especially of the autogenous product, are clearly indicated by the results obtained in this case. Evidently the saving feature in this case, at the time of the excessive toxemia, was the active condition of the eliminating organs. The enemata given before the operation favored this function. Thorough examination into, and the proper preparation of, these organs, before an anticipated toxemia seems an imperative duty. The writer cannot but assume that disregard of this preparation of the eliminating organs may account for the occasional disaster attending the use of any of the various toxins nowadays employed in therapy.

The case may be adduced as indirect evidence, that whenever possible, the focal organs should be removed. The tubes and appendix were such focal organs in this case. The disease persisted here, even after extensive permanent cure of the disease of the small intestines, lungs and pleura. Of course this procedure was contraindicated in this case, because of the grave general condition of the patient at the time of the first operation. Any work beyond the actual immediate need was necessarily postponed. An early secondary operation, in similar cases, is urgently advisable. It is evident, from this case, that pulmonary and pleural tuberculosis, complicating tuberculous peritonitis, does not of itself contraindicate laparotomy. It is also clearly shown by the history of this case, that individuals predisposed to tuberculosis and weakened by lung disease, require active supervision and treatment for a long period after laparotomy and an apparent cure.

224 NORTH MERIDIAN STREET.

## URETERAL INJURIES.<sup>1</sup>

BY

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IN studying the literature of this important subject, I have been much impressed with the paucity of our knowledge and the futility of our resources in dealing with this condition. Many surgeons are felicitating themselves that a ureteral injury has not occurred in their practice, but I am sure they do not realize that a ureter can be tied off or clamped, and the patient need

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

suffer no symptoms which would give rise to even a suspicion of the accident. No pain results, no appreciable hydronephrosis occurs; in fact, the kidney is simply killed, its function is at once in a great measure suspended, and gradually it atrophies until there is nothing left but a fibrous cord. These injuries may occur during the progress of an abdominal operation; perhaps in the enucleation of large and deeply imbedded fibroids, or in the removal of malignant growths; in fact, in a hysterectomy, vaginal or abdominal, for any condition. The ureter may be accidentally cut, torn, cauterized or injured anywhere in its course, high up between the kidney and bladder, or low down at its entrance into the bladder; or it may be purposely tied off, so as to exclude the function of the kidney, if for any reason, this course was deemed advisable. As, for example, where the ureter had been injured and it was found necessary to complete the operation as quickly as possible on account of the serious condition of the patient, or because so large a piece of the canal had been removed that it was impossible to approximate the ends.

Some interesting experiments have been made on animals by Kawasoye (*Zeit. f. Gyn. Urologie*, 1912, III, 113) to determine which was the best method to occlude the ureter: (1) by simple ligation; (2) the formation of a two-limbed U-shaped kink, the two limbs being tightly tied together; (3) the formation of a three-limbed Z-shaped kink, the three parallel limbs being sewed together with catgut, and a simple ligature in addition being thrown around the ureter distal to the kink; (4) the formation of a true knot in the ureter distal to which a simple ligature was placed. Only the last of these methods has proved trustworthy—"Clark."

In all ligature operations in which stasis of urine and dilatation of the ureter above the point of ligature takes place an abscess or fistula is apt to result from the cutting through of the wall of the ureter by the ligature. So, in order to get perfect occlusion of the tube by fibrous organization which will completely obliterate its lumen, the ureter must be well loosened out of its bed and a knot made in it and then the open end tied by some sort of ligature material, because in this way the urine as it is secreted trickles so slowly into the tube that little or no pressure is made at the point of ligature from distention.

When the ureter has been injured high up during an abdominal operation the divided ends can often be found and may be brought together by one of the many methods in vogue for



ureteral anastomosis, or perhaps the distal end can be lifted up and dissected out freely, so as to implant it into the bladder, at a point sufficiently high not to interfere with the gravitation and free flow of the urine, and, if successfully performed, the future function of the kidney will not be in any way jeopardized because the injury was repaired before any secondary changes could have taken place in the organ. If, however, the ligature slips, or the union is imperfect, or a slough results from pressure necrosis from a clamp, and a urinary fistula follows—whether abdominal or vaginal—an interesting pathology sets in; a more or less distention of the ureter and calices has taken place, and an ascending infection is added through this open end, which in time produces such destructive changes to the renal parenchyma that the future of the kidney is so imperilled that its removal is often necessary, not alone because of the annoyance due to this urinary dribbling, but because of the pain, distress and ill health consequent upon the irritating presence of the infected and useless organ.

Some interesting experiments upon dogs have been made by Beers of New York, and his conclusions may be of some value in this class of injuries, as reported in the *Medical Sciences* for June, 1912, and the April number of *American Journal of Urology*. The Mayos and many other surgeons knew clinically that when a ureter had been injured and a urinary fistula had resulted and had existed for four weeks, ureteral implantation was not advisable, and when the implantation had been successfully made, often it became necessary to take out the kidney. Beers operated upon sixty dogs, and his observations and experiments extended over a period of four years.

“He found that after ligation of the ureter hydronephrosis developed in aseptic kidneys, with cessation of secretion, at about the third week. The kidney then began to shrink, and at the end of three months there remained only a fibrous mass not more than one-fourth the size of a normal kidney. If before the end of three weeks the ligature was removed, and the unobstructed kidney taken out by nephrectomy, the released kidney was found capable of functioning satisfactorily. If, after ligating a ureter, septic organisms were introduced, the kidney and its pelvis became distended, kidney substance disappeared, and at the end of three months there was found only a mere cystic shell of the kidney and its capsule. In the septic cases removal of the ligature and nephrectomy of the unobstructed kidney always led to a

fatal result. The importance of these investigations cannot be overestimated since they taught us, first, that the occlusion of an aseptic kidney might result in no harm except atrophy of the organ; second, that if within three weeks the ureter was reimplanted in the bladder, the kidney would resume its function; and, third, that a ligated septic kidney degenerated beyond redemption. If accidentally ligated, cut, or otherwise injured, the ureter should at once be repaired, reimplanted, or released, or later the complete removal of the kidney would be an imperative necessity."—*Gallant*.

The dangers of ureteral injuries are much greater when operating through the vagina, and particularly if the vagina be small and the uterus placed high in the pelvic cavity, and I believe these dangers are increased by the use of the clamp forceps, because, in this class of cases, the forceps are usually removed after thirty-six hours, when the possibilities of hemorrhage from the opening of the divided vessels has ceased. If the broad ligaments have been tied off by catgut, and especially chromic gut or silk, then these late sloughs, as are occasioned by the use of forceps, are not so often seen because the ligature is a permanent method of hemostasis, and if the ureter is encircled in the knot it remains so long occluded that its lower end may become permanently sealed, but not always, as was shown by Kawasoye's experiments previously referred to, and the kidney will be forever put out of commission and with no disagreeable symptoms, providing the other organ is healthy, because it so quickly hypertrophies, and vicariously does the work of two.

Perhaps the matter of secretion after occlusion of the ureter is simply one of hydrodynamics, and goes on until the limit of distention of the ureter and pelvis is reached. Then the extra-renal pressure becomes greater than the secretory pressure, and secretion ceases, and when the function of the renal parenchyma is at an end atrophy results.

A very important question presents itself to the practical surgeon: assuming that it is not desirable or possible to satisfactorily replant a torn ureter into the bladder, what shall we do and when shall it be done? Many of these cases of urinary fistula and its consequent urinary dribbling, if left, close of themselves. The kidney shrivels and stops secreting, and the leak ceases, and the patient is satisfied and perhaps enjoys excellent health. How long a sensitive woman can or should submit to this very annoying and distressing condition is a matter for grave

and serious reflection. Murphy maintains that "if you take out a kidney that has only a little of its tissue destroyed, you hazard the life of the patient 30 per cent.; that is, thirty in one hundred die. If you take out a kidney of which little is left, only a shell—you hazard the patient about 2 per cent." It seems to me, therefore, that it is prudent to have these unfortunate women bear their burdens for a few months, until the danger time of operative intervention has been reduced to a minimum, because at a late date the good kidney has assumed the work of the disabled organ and the dangers of urinary suppression from operation are practically eliminated, and then perhaps a case, when left this length of time, may close up and give no further annoyance or trouble.

Let me briefly report an interesting experience which came to me when I least expected it:

I operated upon a Mrs. Z., æt forty-eight, on October 10, 1911. She had two children, one twenty-six and the other seventeen years of age. Diagnosis: uterine prolapse, with cystocele and rectocele; the cervix came out beyond the introitus, although the body of the uterus remained well up in the pelvic cavity and retroverted. I did a vaginal hysterectomy, with anterior and posterior colporrhaphy and perineorrhaphy. I separated the structures well off to right and left and presumed the ureters were out of the path of injury and clamped very close to the uterus, as it was perfectly healthy. I used the clamp method, as I thought it would be the easiest and safest operation, and I did a vaginal hysterectomy because I did not wish to make an incision into the abdominal wall, as the woman had a very beautiful figure, and also on account of the possibility of future adhesions. The technical difficulties were not great, and the operation was easily and quickly done. On the evening of the second day the temperature rose to 100°, but after that it remained normal, and the pulse was only once above 90, and then fell to 70 and remained there throughout the convalescence. There was practically no pain, and only twice she received an eighth of a gram of morphia hyperdermically. She voided in the first twenty-four hours over 1000 c.c. of urine, and thereafter over 1500 c.c. every day. She left the hospital on the fourteenth day, and was about her house, when on the seventeenth day, while in bed, she felt something give away, and then noticed that urine was coming freely through the vagina. Upon examination I found some loose sloughs in the vaginal vault, which I removed and directed her to use a douche for a few days, and to estimate the amount of urine

passed in twenty-four hours, and what she voided at any one time. She never passed more than 2 1/2 to 3 ounces, and the total amount collected in twenty-four hours was a little over 1 pint. This state of affairs continued for about five weeks, when I called in Dr. Lothrop, who assisted me in cystoscopying the bladder and to whose experience I give much deference. First, we let run through a catheter into the bladder, some weak methylene blue solution, and noticed that it did not return by the vaginal opening. We then put a pint of the solution into the bladder, and withdrew it through the catheter, which showed us that the bladder was not injured and that the ureteral opening of the bladder was closed. After washing the bladder clean of the blue solution, we catheterized the right ureter, but could not get into the left one. It was now evident that the left ureter had been injured and the slough had given away and there existed a left ureteral fistula. Two courses were open to me: either to remove the kidney, which I thought was a cowardly proceeding, or to reimplant the torn end into the bladder. I at once communicated with Dr. Will Mayo, whom I knew had had a large experience in ureteral surgery, and his very practical letter to me made me at once decide that perhaps it was the best surgery to remove the kidney when a ureteral fistula had existed for so long a time. The woman willingly accepted my advice, and went to the German Hospital and I removed the kidney which I found very adherent and considerably enlarged. It was delivered with a great deal of difficulty. The woman voided 38 ounces the first day after operation, and under salt infusion 60 ounces of urine were passed in the second twenty-four hours, and a normal amount thereafter. She left the hospital on the tenth day, and I am pleased to say she is now a well woman. The plastic surgery which was done on the anterior and posterior vaginal walls and the perineum are very satisfactory, and there is no tendency whatsoever to a returning cystocele or rectocele. Her blood pressure is 127. I append herewith the report of Dr. Williams, pathologist to the University of Buffalo, and Dr. Will Mayo's very practical letter to me.

Dr. Mayo writes; "I think that taking everything into consideration, it is a question whether or not it would be wiser to remove the kidney. It undergoes such rapid changes after the ureter has been cut, and in a considerable number of cases, nephrectomy eventually becomes necessary, and at that time the kidney is usually found to have but little function. The

patient, who has but one perfectly good kidney, is better off than a patient having one good kidney and one bad one. In the case of the patient having one kidney, the kidney quickly hypertrophies and is competent to do the work for both."

DR. WILLIAMS' REPORT ON THE SPECIMEN.

Case of Doctor H. E. Hayd.

Left kidney; weight, 5 ounces, pink in color. Two small areas of subcapsular hemorrhage said to be the result of operative clamps. On section average width of the cortex is  $1/4$  inch. Capsule strips with a little difficulty leaving a moderately finely granular surface; cortex pale, pyramids bright pink; pelvis distended, mucosa thickened and roughened; mouths of calices distended.

*Microscopic*.—Capsule moderately thickened with numerous areas of cellular infiltration between the tubules with a few fibrous glomeruli and sclerotic arteries. The convoluted tubules show granular debris, probably unimportant; the straight collecting tubules show desquamation of the epithelium and some hyaline casts, and some hemorrhage between the tubules. The pelvic mucosa is swollen, with a uniform infiltration with leukocytes, many eosinophiles and large numbers of lymphocytes, often in masses, beneath the epithelium; these latter may represent the lymphoid tissue of the mucosa.

The infiltration of the polynuclear leukocytes gives the most conclusive evidence of inflammation. The small veins below the epithelium are dilated and to a large extent filled with polynuclear leukocytes. The polynuclear leukocytes also infiltrate the layers of the epithelium between the epithelial cells.

Several medium-sized arteries in and below the mucosa show marked hyaline degeneration. Long slim cells in mucosa, arranged in parallel strings may represent budding capillaries. The infiltration of leukocytes extends widely into the fibrous tissue around the pelvis.

None of the changes noted in the kidney itself seem definitely referable to the surgical condition. The pyelitis in the pelvis of the kidney probably is.

493 DELAWARE AVENUE.

DISCUSSION ON THE PAPER OF DR. HAYD.

DR. ALBERT GOLDSPOHN, Chicago.—It is very true, as the Germans experienced first years ago, that injury of the ureter is of frequent occurrence, especially during or after vaginal hyster-

ectomy. This was more especially the case when the old French method was employed, clamping the structures and taking the clamps off one or two days after, a thing that ought not to be necessary except very rarely. It is a brutal piece of work. I cannot call it surgery to do vaginal hysterectomy chiefly by that method. The peritoneal cavity must then be left open which should be closed as a rule, the same as when we invade the peritoneum from anywhere else, unless drainage is necessary.

I am surprised at what Dr. Hayd said, that Dr. William Mayo advises extirpation of the kidney so soon after that accident, because we know that the kidney gradually and slowly undergoes atrophy when the urine runs astray. That is correct, but the atrophy of the kidney under these condition is a slow process. If the ureter is ligated, tie a knot in it and ligate it beyond the knot. That is the best thing for us to do when we meet such an injury high up, too high to reimplant into the bladder. It is either that or implant it into the ureter of the opposite side. If the case is a desperate one, and in order to get through safely, it is best to tie it, then there will be atrophy of the kidney in a rather short time for the reason the doctor has mentioned. But when the urine is at liberty to escape, the atrophy is a slow process; and I can say from an experience of two cases, that it is not necessary to extirpate the kidney so soon. Some years ago I did reimplant the ureter after it had been injured in a vaginal hysterectomy, in one instance by myself, and in another by another surgeon, reimplanting the ureter into the bladder in cases that were both more than six months old and with the best effect. The injury had been noticed and these patients were cautioned against permitting any septic condition in the vagina, so that the ascending infection might not occur before they were ready to have this operation done. I can say from experience and from the opinion of the Germans at least, that it is not right to extirpate the kidney so soon if at all. If the patient will not consent to this second operation and extirpation is contemplated, then wait about half a year before you extirpate, for the reason that at that time, the other kidney will have assumed the function of this kidney whose urine has been running astray and the latter will be no longer needed.

DR. THOMAS B. NOBLE, Indianapolis.—I am exceedingly grateful to Dr. Hayd for bringing this matter before the Association. As he says, it is years since such a subject was presented before this Association, and yet it is a matter of rather frequent occurrence and occurs in the practice of every man who does much of our type of work. It is a matter that will come up in medico-legal ways. A more uniform opinion should exist as to when a nephrectomy should be done following a wound of the ureter. I believe that the ureter can be avoided more frequently than it has been. I dare to make that statement. I do not make it in a spirit of criticism. It does occur as an accident I believe, and I believe that, at the same time, the accident can be avoided if



we exercise care in the performance of the different types of operations. My observation has been that this injury occurs, as has been said, very frequently in vaginal hysterectomy and in the removal of peculiarly situated fibroids; and furthermore, it will occur in cases of retroverted, prolapsed adherent uteri with old infected tubes and ovaries that involve the pelvic wall posterior to the broad ligaments, in which infiltration has occurred into the broad ligament—through the peritoneum—out into the pelvic wall outside of the peritoneum, the periureteral areolar tissue, if you please. In these cases, where a panhysterectomy is usually and properly performed, unless great care be exercised in putting the finger on this pathology, we are very prone to make it include the lower end of the ureter which will be torn.

DR. LOUIS FRANK, Louisville.—This is a subject in which I have been much interested, and though so far as I know the accident has not happened to me, I am sure that we have all tied off the ureter without a knowledge of the fact. I am absolutely sure of this. Probably all have done it once or twice, some of us oftener. I am not going to discuss what the last speaker said, namely, the type of case where this accident is liable to happen, where it is impossible to avoid it by any procedure whatsoever.

The statement was made by Dr. Morris some six or seven years ago, as you will find in the Transactions, that the ligation of the ureter in the human being was followed by absolutely no evil consequences and that atrophy of the kidney always took place. As a result of some recent experimental work undertaken last year, and remembering Dr. Morris' statement regarding the results of ligation of one ureter, I wish to say that it is quite a different proposition from the ligation of both ureters. Our experiments in tying one ureter showed some interesting facts. In the first place, I am convinced that the ligation of a single ureter with healthy kidneys is not a safe procedure for the exclusion of the kidney. We find in a certain percentage of cases in these experiments that the animals developed marked pathology in the excluded kidney. We have some of the dogs living for more than a year with one ureter ligated, one dog with a fistula that has lived more than a year. It has been demonstrated that in some cases infection takes place through the blood channels; that the dammed up kidney becomes a *locus minoris resistentiæ*. This was pointed out by Brewer in his address before the Section on Surgery of the American Medical Association. Some of the kidneys became converted into a large abscess sac. We have found it difficult to produce ascending infection as long as the urine is flowing out. In uretero-vaginal fistulæ or in any ureteral fistulæ, where the parts can be kept clean, ascending infection will not take place. We have infected the ureters in dogs with fistulæ, kept the external orifice of the ureter clean and no evidence of pus in the kidney could be found. So much for the question of destruction and infection of the kidney after ligation and ureteral fistulæ. The

kidney is never absolutely destroyed after ureteral ligation. I believe that the doctor misunderstood when he said the kidney undergoes complete atrophy. It becomes the seat of fibrous infiltration. Nature replaces the normal structures with fibrous tissue, and a certain amount of contraction takes place.

As to the duration of function after ligation of the ureter, it has been supposed to exist for two weeks. In some cases of ours it has existed for two weeks and in some of the experiments it would last longer than that.

As to the method of exclusion, we have found that by tying the ureter with an absorbable ligature you can produce absolute exclusion that will last as long as one year. What happens after infection has taken place? We have abscesses formed in the kidney and the kidney becomes destroyed.

As to implantation of the ureter after fistula formation, how long should we wait? Practically, it makes no difference at all how long we wait if we have enough ureter to implant. If implantation of the ureter cannot be carried out, the kidney should be removed. After the ligation, if obstruction has existed for several days, and the other kidney has proved its functional ability to do all the work, we can remove the kidney. There is a mortality of 30 per cent. following the removal of the ordinary normal kidney, according to Murphy, but in this I disagree. I do not believe that the removal of a normal kidney, in the presence of another normal kidney, is followed by 30 per cent. mortality. I know it is not so. We do know that the removal of a kidney which has ceased functioning is not as disastrous as the removal of a supposedly normal kidney, for the reason the other kidney is carrying on the function, and we can rule the necessity of increased work out of consideration. It is largely a question of the function of the remaining kidney.

With reference to the question of fistula, it is stated that they sometimes disappear spontaneously. Not all of these apparent cures are the result of reestablishment of continuity of the ureter. In our experimental work we attempted to produce the same thing as we do in our operative work. We tied up the ureters with catgut; we tied them up with nonabsorbable sutures, when we found the catgut would be absorbed. When we implanted it in the abdominal wall there was absorption of the catgut and the establishment of a fistula. In one dog in which the urine ceased to come out of the fistula we believed we had a restoration of function. We allowed him to go on for two or three months, then opened him up, and found complete occlusion with a tremendous suppurating kidney on that side. The point I want to make is that occasionally the ureter may become occluded secondarily by cicatricial contraction as the ureter retracts and then the kidney is put out of commission completely.

When shall we do a nephrectomy in these cases? Where restoration of continuity cannot be carried out or the ureter transplanted into the bladder, nephrectomy should be done. If the

fistula is where it cannot be kept clean, nephrectomy should be done as soon as the patient will stand the operation, and in such a case as Dr. Hayd has reported it could have been done earlier without any more danger than from any secondary operation of the same magnitude.

DR. GEORGE VAN AMBER BROWN, Detroit.—I wish to mention a case reported in literature in which, while doing a hysterectomy, the ureters had been tied with catgut, the accident not being detected until the abdomen had been closed. A stab wound was made into each kidney establishing drainage for urine until the catgut was absorbed, after which time the ureters were again functioning, when the kidney wound closed and the patient recovered. I cite this case as a hint to us, useful in handling these cases.

DR. RUFUS B. HALL, Cincinnati.—The ureter will be injured occasionally by the most careful operator, and I rise to speak in reference to the medico-legal aspect of this subject which was referred to by one of the previous speakers. I wish to amplify the statement made by him. In the very cases in which you injure the ureter you least expect to do so as a rule, yet there are cases where you do fear that you will injure the ureter, where you know that you may injure the ureter, and that is the one which you say one ought to catheterize so that you can locate it, but that is the case in which it is impossible to catheterize the ureter.

I refer to the *postperitoneal tumors*. You have, for instance, a tumor filling the pelvis, extending well into the abdomen, that is postperitoneal. You may catheterize the ureter on the right side, but when you come to catheterize the ureter on the left side you cannot do it because the tumor blocks it up. Not infrequently you expect a fibroid, and find maybe a fibroid or maybe a postperitoneal sarcoma. You go ahead and remove the tumor, and in so doing you remove a section of the ureter. If it should go out from this Association that we should avoid the ureter in these cases by knowing where it is by catheterization, the lawyer has a good job and you are up against a very tough proposition in your self-defense. A patient demands relief, the surgeon removes the tumor, and in so doing he removes a section of the ureter on one side. He may not have known it at the time of the operation, but he knows it soon afterward. It has occurred to the speaker on three or four occasions to have injured the ureter accidentally in operating. This is a question to which we have to give due weight and consideration, because our transactions are used by the lawyer in his prosecution of men for malpractice, and at any time a lawyer in court is apt to take up one of these volumes and say that Dr. so-and-so said so and so, and how are you going to meet it? You must exercise due caution. If we can put a catheter in the ureter, of course we can avoid the ureter. That is perfectly self-evident, but I contend there are cases in which no man can catheterize both ureters with a tumor blocking up the pelvis.

In reference to another case, in the early history of this work, about fifteen or sixteen years ago, I removed a postperitoneal tumor. I thought it was a broad ligament fibroid. It was situated low down and behind the uterus. In removing it I cut out a section of the ureter. I did not know that I cut off a piece of the ureter until some urine later came through the drainage tube. I left the tube in longer than usual and all the urine from one kidney came through the wound and persisted in doing so. She refused to have any further operation done, and has now a ureteral fistula. It is fifteen years since the operation was done. There is no disease of the kidney that can be determined by bimanual palpation or other examination.

DR. H. W. LONGYEAR, Detroit.—There are cases in which the rule suggested of producing atrophy of the kidney or leaving it for several months before its removal, cannot be followed. Such a case fell to my lot in which I knew I injured the ureter. The case was one of abdominal hysterectomy, with supravaginal amputation, for a large multinodular fibroid, part of which was intraligamentous. The woman made an ideal recovery. Before the end of the second week she complained of some fullness on the right side, and on examination I found a fluctuating tumor near the crest of the ilium. On incision quite a quantity of urine escaped. I kept up drainage for several days, then resorted to ureteral catheterization and found there was no urine passing to the bladder from that side. While the catheter was in place I made the incision larger, going under the peritoneum, and found the lower end of the ureter by the catheter, but could not in any way find the portion of the ureter coming down from the kidney, although I had given methylene blue, hoping I could detect it by the color. There was a cicatricial mass obscuring it, and I was obliged to give it up. I either had to go above and go into the pelvis of the kidney, and come down through the ureter and try to unite it, or remove the kidney, or leave a fistula. I extended the incision upward, took out the kidney, and a perfect recovery ensued. It would have been impossible to have tied off the ureter, because I could not find it without going in from above. It would have been impossible to leave the case with a fistula of that kind without infection, which usually results in ultimate destruction of the kidney in such cases.

DR. J. HENRY CARSTENS, Detroit.—I had a number of cases of fistula in former years when I used the clamp. I do not use the clamp now except in rare instances. I have found in some cases that perhaps we do not clamp the ureter, but with the clamp we sometimes have more or less sloughing as a result, an ulcerative process goes on and perforates into the ureter two weeks or more after the operation. Fifteen years ago I had a patient with a fistula. There was excessive granulation, and I applied a little nitric acid three or four times, when the fistula closed and has remained closed.

I had another case in a strong healthy woman, who had a very

narrow vagina. I used clamps. She had a fistula. After three or four months I took out the kidney. She had no further trouble. I had one other case where I did the same thing. The statement has been made that when the ureter is pervious and the urine runs out, the kidney continues to functionate. In my experience the kidney never ceases to functionate. If you take out a kidney which is carrying on one-half of the function of elimination, the other kidney has to do the whole work on short notice, and does not that kidney come up to the mark? It always does. You have no trouble at all. I want to make the point that, having two healthy kidneys in a perfectly healthy person, if you remove one kidney, the other kidney will do the work, and need not necessarily *gradually* develop hypertrophy.

DR. HENRY D. FURNISS, New York City.—In these cases of injury to the ureter it depends whether you detect the injury at the time or whether you discover it afterward. In injuries of the ureter, you should implant the ureter into the bladder, if possible. If you cannot do that, I would not hesitate to take a chance of implanting it into the large intestine, even though there is a possibility of pyelitis occurring. Pyelitis, even though it does occur, is not apt to be fatal; it may exist for a long time, and if it should occur, the kidney can be taken out afterward. If I could not implant the ureter into the bladder or colon, I would put it out under the skin in the lumbar region, allowing it to project over the skin and not suturing the ureter to the skin, because if you do, you are apt to get a fistula. Recently I put two ureters out on the back preparatory to the removal of the whole bladder. In these cases you do not realize that you have injured the ureter until a week or twelve days afterward, or unless uremia sets in. In the Wertheim operation there is 1 per cent. of urinary fistula following it, due to necrosis, and the cases in which this occurs show up about ten days afterward.

I have seen some five cases of injury of the ureter. One where the ureter had been previously catheterized was cut, repaired at the time of injury, and the patient has had no subsequent trouble. One woman in whom both ureters were ligated died of uremia. Another had both ureters ligated during a vaginal hysterectomy, and the urine after three days escaped through the vagina. In this case both ureters were subsequently implanted into the vagina; cystoscopy three months later showed both kidneys discharging urine that upon examination was normal.

I had another case in which abdominal hysterectomy was performed, where the woman developed ureteral leakage through the vagina. It was difficult in that case to make a diagnosis of ureterovaginal fistula. It was thought at one time she had incontinence of urine from cystitis, and possibly she had a fistula.

One of the great points in the early diagnosis of these cases is that where the vaginal leakage approximates in amount that of the urine voided by the bladder ureterovaginal fistula should be suspected. At times the only way to detect an injury is by



putting a pledget of cotton in the vagina and giving the women methylene blue; then we are able to locate the fistula by the stain.

We can determine the function of the kidney in these ureteral injuries by the administration of indigo-carmin, and compare the elimination from the bladder with that from the vagina. But there is one point to be remembered; when indigo-carmin and methylene blue are given to a patient who passes alkaline urine, it is excreted as a colorless urine. If we use the phenol-sulphophthalein test, it makes no difference whether the urine is acid or alkaline, we can determine just the percentage that is eliminated.

DR. JAMES F. BALDWIN, Columbus.—I wish to report one more case to those given by Dr. Goldspohn, in which I implanted the ureter into the bladder after the lapse of considerably more than four weeks after the original operation, which had been a vaginal hysterectomy for cancer. It is possible that the kidney atrophied after this operation was done, but there was no evidence of that. The patient died of recurrence some two or three years later.

Nearly all of the cases of urinary fistula which have been reported to-day have followed vaginal hysterectomy. In 1896 I made a special visit to Paris for the purpose of seeing the masters there do vaginal hysterectomy. I saw Pean, Pozzi, Richelot, and others doing this work with the most beautiful technic. I became enthusiastic over vaginal hysterectomy, and performed it a good many times after my return; but gradually I got over my enthusiasm, did more and more of the work through the abdomen, and at the present time I probably do not perform a vaginal hysterectomy oftener than once in two years, while abdominal hysterectomies are a matter of daily occurrence. I can do an abdominal hysterectomy almost as quickly as the vaginal; I do not injure the ureter; I can examine the patient for gall stones, chronic appendicitis and Lane kinks, and my patients recover as thoroughly and as rapidly as after the vaginal operation. I do the latter operation only in some extreme cases in which seems safer than the abdominal.

I am surprised to hear of ureteral fistulas following the Wertheim operation. I like that operation very much, and do not see how the ureter can be injured. Occasionally in removing broad ligament cysts, fibroids, bad pus tubes, etc., as mentioned by Dr. Noble, the ureter is brought up, but I am watching for it, push it out of the way, and have never had a fistula. In those cases if much of the ureter has been exposed, I open the vagina and pass in a wisp of gauze, so that if there is any slough the urine will have a direct exit.

DR. X. O. WERDER, Pittsburgh.—I asked Dr. Hayd the question whether he had put in gauze drainage, because I have had two cases of ureterovaginal fistulæ as a result of the use of gauze drain, a number of years ago before I knew better. One case was a large tuboovarian abscess in which, after its enuclea-



tion, I found a large part of the ureter attached to the abscess wall, which I had considerable difficulty in separating without injury. Before closing the abdomen I put in a gauze drain right along the course of the ureter into the vagina, and ten days afterward a ureterovaginal fistula developed which, I am sure, was caused by the contact with the gauze with subsequent erosion of the ureter. In that case there was a spontaneous cure about six or eight months afterward. The leakage stopped, probably due to atrophy of the kidney.

Another case was one in which I had done a hysterectomy for a large intraligamentous fibroid. The operation was done in the afternoon. The next morning I found that not a drop of urine had been passed. I at once reopened the abdomen and found one ureter cut and the other tied. I implanted the cut ureter into the bladder and loosened the ligature on the other and put in along the ureter a gauze drain, and about ten or twelve days afterward I had a double ureterovaginal fistula, resulting, I feel confident from the gauze drain. This case was cured by turning a diverticulum of the bladder into the vagina, the patient has perfect control of her urine to-day though this operation was done about twelve years ago. It is a serious mistake to bring a gauze drain in direct contact with the ureters. It is always best wherever possible to cover the ureters with peritoneum; if this is not possible and drainage is considered necessary, then the gauze should be kept at a safe distance from the ureters. If you use drainage alongside the ureter, you are almost certain to have a certain amount of necrosis with a resulting fistula.

I have not been so fortunate as most of you. I have had five or six cases of fistula, three of which were in cases of carcinoma of the cervix where a radical operation was done. In one case the kidney was removed subsequently by another surgeon, in the second case I resorted to implantation of the ureter into the bladder with a cure, but the patient died a year or so afterward from recurrence. At the time I opened the abdomen and dissected out the ureter I found the iliac glands considerably enlarged and enucleated them; microscopical examination proved them malignant. That patient died from a recurrence a year or fourteen months later.

In another case I had a double ureterovaginal fistula follow about ten days after operation. In this case I had done a vaginal igniextirpation for carcinoma of the cervix. The woman was sixty years of age, very fat, and for that reason I choose the vaginal route in preference to the abdominal. I put in gauze drainage and feel pretty sure this was responsible for the fistula in this case also. At any rate, ten days afterward we had leakage from the vagina and a day or two later all the urine passed away in this manner, and none at all reached the bladder. The patient went home in fairly good condition with the exception of this constant leakage. Six weeks later her family physician informed me that the vaginal urinary discharge had completely ceased

and that the bladder was functioning normally. A spontaneous closure of these fistulæ had evidently taken place.

DR. ALBERT VANDER VEER, Albany.—I want to speak of a case that occurred in my practice in 1869, where a patient was tapped and tapped, as we used to get these patients, and it was my second case of ovariectomy. I recall very vividly the tremendous hard work I had in getting the tumor out. We were then following up Dr. Peaslee's favorable commendation of draining through the vagina. I introduced a T-drainage tube through the vagina, and was never quite satisfied as to what happened, whether I injured the ureter at the time of the removal of the tumor, or whether the introduction of the instrument, the scissors, used for making the incision may have done some injury to the ureter. At any rate, a few days afterward the patient had a profuse discharge of urine. She lived some little time, but I doubt whether we could have cured her even at the present time, owing to the extensive adhesions and the great size of the tumor. Naturally I thought over that case and what I was going to do, as she was discharging urine from the vagina, and about that time Simon published his first case of removal of the kidney for the closure of a ureteral sinus, and which brought me considerable comfort in this way. I said later we would remove this woman's kidney as I believed it was the proper thing to do. That case has always made a profound impression upon me.

As to vaginal hysterectomy, I agree with what has been said by the two previous speakers, that we have not been favorably impressed with that operation. It is seldom that I do this operation now. I have gone through the experience Dr. Baldwin referred to, and I must say that I do not like to do vaginal hysterectomy because I can do better work above. In one case I had an injury to the ureter, and for some twelve days afterward the patient passed a great amount of urine through the vagina. I could see a fistulous opening on the right side in the ureter. I did not attempt to do any operation nor an anastomosis, but I brought over connective tissue, in connection with the ureter freshened it, and put in a suture in that way. I was much pleased a few days afterward to know there was much less discharge and by simply keeping in the vagina packing for a little while the woman made a good recovery and lived for some eight years thereafter, not having any further return.

A very peculiar case came to the hospital with pelvic trouble soon after that, and I said to my assistant, "I am about through with vaginal hysterectomy." But he said it was the only thing to do. I said to him, "if you want to take this case and remove this uterus which, I believe is bound down with adhesions in every direction, and not do any harm to the ureter, you can operate on this woman." Well, he was full of vim. He took hold of the case and operated, and whatever happened in doing the operation, he said ten days afterward she was discharging a large

amount of urine through her vagina. I examined the case with him, and it was apparent that injury had been done to the ureter. We watched the case for some time, for nearly a year, the woman suffered so much distress that she came into the hospital, and I did a nephrectomy from which she made a good recovery. But it was a kidney full of abscesses, and one that had become infected. Therefore I cannot quite agree with Dr. Carstens that these patients are going to escape infection. The experiments made upon dogs only recently, where the ureter was implanted into the rectum, show that the kidneys became infected in the majority of cases. In many of these cases of suppurating kidney I like to do the operation of nephrotomy, in the first place, and then, if necessary, remove the kidney afterward. If the other kidney is free from disease and is doing its work well, the mortality following nephrectomy of the other organ has been exceedingly low.

I have done a fair amount of abdominal surgery in my time, but I have never yet injured the ureter in operating above to my knowledge. I believe there is a mistake in the statistics, because I do not think we have so many of these cases of injuries to the ureters.

DR. HAYD (closing the discussion).—I am extremely obliged to the Fellows for their splendid discussion of my paper. Their remarks have illuminated the subject considerably. To the younger men I wish to say, they must not think we do not invite criticism, because we get it here in this Association with ungloved hands, and I am surprised I did not get it harder than I did. It is a mighty serious question to operate on a rather prominent woman and find that you have cut or injured the ureter.

In regard to the remarks made by Dr. Frank, I will say that I read the experiments of Beers very carefully. I read everyone of the cases. I epitomized the article and I think I understood it, but whether Dr. Frank got the same results in his experiments with dogs as did Beers in his experiments on the same animals I do not know. He and Beers will have to work that out. I have worked out Beers' results and they agree with the experience of Mayo and other surgeons who say that a kidney that has been leaking through an injured ureter for many weeks had better be removed. My patient was passing a half pint of urine through her vagina, therefore, I knew her kidney was functioning, but I did not know that if we reimplanted the ureter of such a kidney degenerative changes which had been started would continue in that kidney, that it would atrophy and make a lot of trouble, and that at some future time it might have to be removed. That is the point.

I could go on and answer all of the points made by the different speakers, but it is hardly necessary for me to do so. Dr. Ill's criticism is well taken, namely, why did I take the kidney out, as it was not in a very bad condition? To look at it, it did not seem to be in a bad condition, but think of the possibilities in

connection with the case. She had a competent kidney. It was doing the work nature called for. I did not want to expose her to a big operation and perhaps fail and if she lived then later be compelled to take the kidney out.

Dr. Noble was particularly kind in helping me out. We worked out where the injury was by the cystoscopic examination. It was a big job to cut open a woman from the sternum to the pubes and find her ureter and reimplant it into her bladder. It is a mighty big undertaking, and fortunate for me I had the support of the Mayos in taking out the kidney, because I can do that as well as any of you. I am not a tyro in this type of surgery. I have done ninety-four vaginal hysterectomies. Why I prefer clamps in some cases and tie off in others is not a subject for discussion now. This accident to the ureter occurred when I least expected it. It can occur to some of you when you least expect it.

## METRORRHAGIA DUE TO ATHEROMA OF THE UTERINE VESSELS.<sup>1</sup>

BY

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METRORRHAGIA is essentially a symptom of some pathological condition either general or local. We should determine that pathology as accurately as possible before operation if we can, or by the use of the curet if necessary. The scrapings from every curetage should be examined microscopically by a competent pathologist. Only by this examination are we able to exclude malignant disease or to determine its presence in many cases.

The routine use of the curet by the general practitioner in cases of metrorrhagia and *without* microscopical examination of the scrapings, as is so often the practice, is to be severely condemned. Many cases of malignant disease are thus overlooked and after a second or third curetage done without relief from symptoms, the case comes to the surgeon with probably a well-advanced case of malignancy. Or the case may be one of those with which this paper more especially deals, that of sclerosis of the uterine vessels and in which repeated curetings have been done without relief but in which the true nature of the condition has not been determined.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

Patients with this condition are usually nearing the climacteric, at the age when we may expect malignant disease. In an occasional younger patient the vessels generally may show premature sclerotic changes and the presence of these changes in patients with persistent metrorrhagia should place us on our guard.

The pathology is fairly definite and although the amount of hemorrhage may not always be in keeping with the degree of sclerosis in the vessels, yet we do find pathological changes in the blood-vessels with an accompanying general uterine fibrosis sufficient to account for the symptoms. The following pathological report by Dr. H. G. Palmer is fairly typical of the cases generally as we find them in our practice.

Pathological No. 2960. Specimen from uterus. Clinical diagnosis, sclerosis of uterine vessels. Pathological diagnosis, hyperplastic endometritis, sclerosis of uterine blood-vessels.

A uterus with appendages removed from a woman forty-two years of age. The uterus has been opened from cervix to fundus and has been in formol solution so that no opinion can be expressed of the gross appearance of the fresh specimen. The uterine canal measures 9 cm. from fundus to os, breadth 3.5 cm. at cornua, 2.5 cm. at internal os. The wall measures 24 mm. at fundus, 18 mm. at internal os.

Tissue for examination was taken from the cervix and wall from os to fundus.

*Microscopic Examination.*—There is a general thickening of the entire uterine wall due to two factors, viz.: increase in fibrous tissue of the uterine wall, increase in all of the essential elements of the endometrium. The endometrium presents a richly cellular stroma in which are present glands augmented both in number and size. These glands are often dilated but are generally round or oval in outline and are lined with a single layer of tall columnar epithelial cells. In a few instances there is considerable reduplication with cuboidal formed epithelium but this is always toward the lumen, invasion of the stroma being entirely absent. The endometrium is generously supplied with capillaries that are dilated and filled with blood cells.

The uterine wall shows a marked increase in fibrous tissue and this is especially marked in association with the blood-vessels, which are numerically increased. Occasionally there is an increase in volume with some cellular proliferation of the intima of the vessels, but this is the exception rather than the rule and the change as generally observed throughout the sections is a very marked increase of fibrous tissue, varying in density, involving the adventitia of the vessels. The fibrous tissue compresses the muscularis and is sufficient to disturb or possibly destroy vasomotor tone with a resultant uncontrollable hemorrhage. The

condition would appear as not a primary disease of the vessels, for there is no true arterial degeneration and the intima is intact and generally normal, but the deposit of fibrous tissue in the adventitia constitutes a true disease that is considered resultant to, rather than the cause of, the general fibrosis.

The specimen was from a patient forty-two years of age. Has had nine children, oldest twenty-three years; youngest three years. Three miscarriages, last one twelve years ago. For past six months has been flowing profusely every two weeks and flow lasting a full week. Heart and lungs negative. No general arterial change noted in history of this case. Urine cloudy, slightly acid, specific gravity 1014, slight trace of albumin. Sediment shows amorphous urates, squamous cells and blood cells, no casts.

*Pathology.*—Examination of the uteri of this class of cases shows an increase in the fibrous tissue between the muscle bundles and in many cases there is a diminished musculature, the muscle bundles having been replaced by fibrous tissue. In other uteri there is an increase of both the musculature and the fibrous elements; the condition is generally a true metaplasia. The blood-vessels appear to be numerically increased but whether this is a fact is questionable. The greatest change in the vessels appears to be in the adventitia and media, the latter being thinned from displacement of muscular by fibrous elements and there is a decided increase in the adventitia from the hyperplasia of fibrous tissue of the adventitia itself and an apparent increase outside about the vessel. The intima is not involved and the lumen of the vessel is not occluded nor diminished in caliber. This should make it possible to rule out syphilis as an etiological factor, for in the latter condition it is the intima which is especially involved and in which the changes are so typical. The condition is more in the nature of a sclerosis or fibrosis than a true atheroma and is met with more frequently than the latter condition, although I believe that a true atheroma would be the ultimate termination of the pathological process if allowed to go on. We do occasionally find a case of true atheroma in which macroscopically the uterine vessels are decidedly hard and brittle and show a typical atheromatous condition. These cases are usually in much older women and there is an accompanying general arterial degeneration.

The gross pathology is also rather typical. The uterus is larger than normal, is flabby from constant congestion. Upon



section the vessels are more numerous than normal and the cut vessels stand out prominently above the surface of the uterine tissue.

That there are sufficient pathological changes present to prevent the proper response to vasomotor stimuli, seems apparent. The vessels have lost their muscular tone and power of contractility due to the increase of fibrous elements in and about the adventitia and a definite loss of muscular elements.

In a most admirable article by Gardner and Goodall on "Chronic Metritis and Arteriosclerotic Uterus," they say that "the hemorrhage in arteriosclerotic uteri is due to pelvic congestion and high arterial tension, with lack of contractility of the vessels in response to vasomotor stimuli, combined with muscular atrophy of the uterine wall."

*The symptoms* are as follows: A woman at or near the menopause is having constant or repeated severe hemorrhages. Examination shows a soft uterus, usually with the external os patulous and the canal roughened. This roughening is due, I think, to the prolonged congestion with the accompanying endometritis and the fact that most of our cases are in multiparæ. The picture at first suggests malignancy, yet our scrapings may show only a simple endometritis. Or our patient may give a history of previous curetings with negative reports and with no relief from symptoms. Usually the symptoms have persisted for a long time, yet there is no apparent loss of flesh and although the patient is anemic there is not that typical cachexia of long-standing malignant disease. The condition which simulates it most closely is that of submucous fibroid without the presence of other palpable fibroids, intramural or subperitoneal. The writer has on more than one occasion made a diagnosis of probable submucous fibroid only to find upon hysterectomy that there was no sign of fibroid, although it was noted that the gross pathology was that of general fibrosis with the vessels standing out prominently upon section of the uterine wall.

Diagnosis of the condition in question may be made before operation if we bear in mind that there is such a condition and that it exists frequently. That cases of intractible hemorrhage occurring at or near the menopause and unrelieved by curetage and in which the scrapings from that curetage show no evidences of malignant disease, may be instances of this sort. We must take into consideration that general arterial changes may occur

in these cases and that upon vaginal examination they show an enlarged, softened, freely movable uterus, with os often patulous, and with no evidences of disease in the appendages or periuterine tissues.

Hysterectomy should be the treatment of these cases and should be performed before they have advanced so far that very marked arterial changes have occurred. General or topical medication is of no avail and any resort to such treatment after we have made up our minds that it is a case of sclerosis of the vessels with fibrosis, is but a waste of valuable time.

The writer has purposely not gone into those cases of metritis, endometritis, diseases of the adnexa and associated conditions which may be a cause of metrorrhagia, as it has been the aim of this paper to call attention to this particular pathology, to the fact that we do find it rather frequently and that when it does exist, radical operation is the treatment.

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#### DISCUSSION ON THE PAPER OF DR. JONES.

DR. CHARLES A. L. REED, Cincinnati.—I wish to express my appreciation of the paper just read. It is a subject to which very little attention has been given. Leopold called attention to it in the seventies. Since that time, it received attention by Tuffier. Leopold's position, however, was that these cases were sometimes atheromatous, and we occasionally hear of atheromatous conditions of the pelvic arteries and of the uterus.

In the last two years I have had occasion to encounter some very annoying cases of this particular type. In one or two of them, after treatment for six or eight months by repeated curetages, I was rewarded by having small fibroids extruded from the parenchyma into the uterus, or small polypi, which seemed to explain the condition. After removal, the hemorrhage stopped for a time, but only sooner or later to recur. In both of these cases a radical operation was declined.

Touching the pathology which has been so admirably presented this afternoon, we are left in doubt as to the sequence of events in the evolution of the condition. In other words, we find the tunica adventitia and tunica media of the two arteries have lost their elasticity because of certain fibroid changes which, according to the histological story, manifest themselves in the parenchyma of the vessels themselves. Therefore, we are forced

to the conclusion that while these arteries are sclerotic and lose their ability to respond to the vasomotor stimuli, the fact remains that probably we classify the uteri as essentially those that take on fibrosis, a point recognized differentially by the essayist himself. This takes us back to another factor to which Leopold called attention, namely, that these changes occurred chiefly in women who had borne children. They, therefore, take us back to the old story of the hyperplasias that were set forth in a very attractive theory of pathologic enlargements. I think, however, that the profession has recognized, in a more or less desultory way, the existence of this pathologic state—this arteriosclerosis of the uterus—but not in that specific way that we shall if we have a few contributions such as this offered to us this afternoon. I feel we are indebted to the author for this contribution, for it takes us away from questions of technic and gets us into something that is of real fundamental importance.

DR. HUGO O. PANTZER, Indianapolis.—Virchow was the first to report sclerotic uterine arteries as the primary seat of atheroma in a woman of some twenty years, who had died shortly after parturition.

About twenty years ago, I had a case of persistent uterine hemorrhage, in a patient of about forty-five years, which at operation revealed pipe-stem arteries. The uterine artery broke repeatedly as it was being tied successively further into the broad ligament. The ligature that finally held, came to be placed near the lateral pelvic wall.

DR. WILLIAM H. HUMISTON, Cleveland.—There is one point I wish to refer to, and that is the necessity for a routine examination of the scrapings of every uterus that has been curetted. Unless you make this, as a rule, and adopt it you are very likely to overlook many of these conditions, especially early malignancy. In every case in which I scrape the uterus the scrapings are sent to the pathological laboratory, and in about one in forty instances there is beginning malignancy, and when a complete hysterectomy is done in such instances it is attended with the best result.

DR. MILES F. PORTER, Ft. Wayne.—I have made two or three clinical observations which seem to show the connection between thyroid changes and uterine hemorrhages in young people. I do not know enough to say anything about it definitely, but I would suggest a careful clinical and pathological inquiry be made along the line of the possible relationship between the pathology occurring in the thyroid and the changes occurring in the uterus that lead to hemorrhages as yet unexplained, and especially does this apply in my mind to those hemorrhages that occur in young women that are not married.

DR. CHARLES A. L. REED, Cincinnati.—I would like to ask the author of the paper to explain to us the technic by which he discovers the sclerosis of the arteries by the scrapings. I have been unable to do that in Cincinnati.

DR. JONES.—I did not mean to convey that idea that I could. The examination of the scrapings may help to make the diagnosis by exclusion.

## INDICATIONS AND TECHNIC IN GASTRIC RESECTION AND GASTROENTEROSTOMY.<sup>1</sup>

BY

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It is the purpose of this paper to consider the following points: In what type of gastric and of duodenal ulcers shall resection be made? in what type shall gastroenterostomy be made, and in what type jejunostomy; what type of management gives the best results in cases handicapped by hemorrhage and starvation? what is the significance of acetonuria? what method of suturing will make the strongest union? lastly, how can shock be reduced to a minimum? Discussing the last point first, the combination of nitrous oxide, general anesthesia and novocaine, local anesthesia and quinine, and urea hydrochloride as a post-operative anesthesia combined with ample incision and gentle handling establishes *anociassociation*—or shockless operation.

*Starved and Anemic Patients.*—A preliminary transfusion of blood brings back the vitality of patients exsanguinated by hemorrhages and make them good risks, thus the surgeon may reclaim the bad risks in hemorrhage from ulcer of the stomach or duodenum.

In starvation cases the risk cannot be so successfully reclaimed though the patient may be much improved by transfusion. The risk in these cases is not shock and depression but a broken metabolism expressing itself as acidosis.

Since employing transfusion I have had the opportunity of seeing more clearly the dangers of acidosis, for I have operated on cases all but moribund and have seen them pass through the operation unchanged, and have seen metabolic death follow. Heretofore such cases would not have been operated, and if operated would not have survived long enough for study. There is a stage of acidosis rather easily recognizable which proves fatal as a metabolic process in spite of complete control of the blood volume, and measurably of the blood pressure. This does not in the least apply to acute or chronic hemorrhage. Here transfusion gives an absolute control.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio September 17-19, 1912.

*Suturing*—The technic of suturing that will hold even edematous visceral walls is an adaptation of the oldest known stitch, viz., the shoemaker or cobbler stitch. A typical shoemaker's stitch may be introduced throughout the entire wound. The stitch becomes an interrupted continuous stitch by tying the sutures several times on each lap and at the corners. A running peritoneal stitch as a second row completes the suturing. It will be at once apparent that this stitch piercing as it does every layer, and so utilizing every atom of the strength of the visceral wall, must be the strongest stitch and will not permit either leakage or hemorrhage. Turning now to the indications in cancer and ulcer we propose the following: In cancer palpable glands may be only inflammatory, if the liver is free, if there is no local invasion of surrounding tissue then resection and gastroenterostomy is indicated; if the patient is seriously weakened by starvation, and is still operable, then a two-stage operation is made. First, a gastroenterostomy and as soon as the metabolic balance is restored, usually in ten days to two weeks, resection is made. In starved cases of ulcer the method of Prof. Von Eiselsberg, viz., making a jejunostomy under local anesthesia then feeding until a safe vital margin is reached, then operate is excellent. But Prof. Von Eiselsberg has found that if the jejunal fistula is maintained for from six to nine months gastric ulcer may be cured. Perhaps the most difficult type of gastric ulcer is that known as saddle ulcer. Gastroenterostomy is of doubtful value; Von Eiselsberg's method though apparently curative is tedious and does not protect against subsequent cancer; medical treatment has of course proven futile. In these cases the German surgeon would make a transverse resection because if a local resection were made the stitch tension would result in leakage. I have found the apparent solution to these cases in the use of the cobbler stitch in the following manner:

First, an ample opening is made into the stomach through a healthy portion of the wall avoiding the larger blood-vessels.

Second, the saddle ulcer is pressed through this opening from behind.

Third, then using a "needle at each end" thread, a cobbler stitch is securely inserted.

Fourth, the entire ulcer is now cut away free from the stitch line.

Fifth, the first incision is closed. I do not believe that any suture excepting one of the through-and-through type—especially

the cobbler stitch—would hold. I have found this stitch amply strong.

Bleeding is controlled by distal clampine of the arteries.

In choosing the type of operation in gastric ulcers, because of the uncertain cure by gastroenterostomy and the probability of cancer, it must be borne in mind that excision is the operation of choice. In duodenal ulcers there is slight probability of cancer sequence, and the ulcer is curable by gastroenterostomy. Cure is perhaps hastened by temporary closure of the pylorus.

*Clinical Results.*—In my personal experience, and that of my associates, Dr. Bunts, F. E. and Dr. W. E. Lower, as well as the Lakeside Hospital records, there are notes on 420 operations for gastric and duodenal lesions. Of these, 208 were performed for cancer; 204 for benign obstructions and ulcers and eight for traumatic perforations.

Summarizing our experience I can say that all duodenal ulcers are cured; congenital stenosis is cured; acute gastric ulcers in the lesser curvature and the cardia treated by gastroenterostomy are often disappointing, but resection cures; in cancer the cures depend on the status of the lesion; resection of gastric ulcer of the sadd type is not only safe but the results are clinically good.

Transfusion of blood in cases of hemorrhage, the mastery of the cobble stitch in all parts of the operations; the performance of shockless operations on the principle of anociassociation has, now given an almost complete control over the operative results in gastric surgery.

#### DISCUSSION ON THE PAPERS OF DRS. CRILE AND KEEFE.

DR. H. W. LONGYEAR, Detroit.—I would like to ask Dr. Keefe what material he used in closing these cases.

DR. KEEFE.—In answer to Dr. Longyear I will say I used catgut on the mucous surface of the stomach and Pagenstecher thread for the peritoneum, and in closing the pylorus I used the same.

This drawing represents the other operation of opening the stomach and the method of making the incision, with the transverse method of closing.

DR. CRILE.—Did you do that in both cases?

DR. KEEFE.—Yes. I had not read anything about the subject when I operated upon the first case. The idea is to separate the hypertrophied muscles from the mucosa halfway about the stomach. It is difficult to make a transverse approximation on account of rigidity and hardness of the tissue between the mar-



gins, but by excising this material for half of the circumference you can overcome this objection. By divulsion you burst through the structures. In the first case in which I dilated with sounds, I noticed that the peritoneum commenced to give way, so I incised with the knife down to the mucosa. In the next case I did the work with a little more deliberation, and in that instance I incised at once after passing a small-sized sound through, and before I dilated I made the incision right over the pyloric tumor down to the mucosa, separated the mucosa from the cartilaginous mass, took out a portion of the hypertrophied muscle on either side, and then passed a larger sound which proved that I had a large patulous pyloric opening, and this operation may be done at the pylorus and the opening in the stomach omitted. This portion of the operation of excising has to my knowledge not been done before.

DR. J. HENRY CARSTENS, Detroit.—I have tried the course that has been pursued by Dr. Keefe, and I think it would be an ideal operation to cut through the various muscles, and not the tissue of the mucosa. It would stretch and we would not open the stomach. On two of these cases where there was stenosis as the result of ulcer I operated with the McGraw ligature, and in those two cases I had splendid results.

With reference to the paper of Dr. Crile, I must say I have always been on the fence, and I did not know that to do with these stomach ulcers. Now in an ulcer of the stomach, what do you do? Cut it out, trim it out, and do a gastroenterostomy? I wish Dr. Crile in his closing remarks would bring out his method of dealing with these cases. For instance, if you have a large ulcer to deal with, with the mucous membrane all gone, it seems to me it would be a good thing to cut away the peritoneum, trim the edges and bring the mucous membrane carefully together, instead of to just leave the ulcer alone and do a gastroenterostomy. Before the ulcer has perforated you can cut away all the peritoneal covering and trim the edges, drain the wound, and bring the ends together. Otherwise I have done gastroenterostomy in such cases.

Somebody made the remark this morning that he used catgut. I have sometimes used catgut, and catgut is not the thing to use for intestinal surgery. A great many years ago in doing an enterostomy I simply took catgut, made a running suture and brought the ends together, the mucous membrane, the serous coat and muscles, and then amplified that by a Lembert suture of silk. I now use Pagenstecher linen. I do not think that the amplifying Lembert suture put on there should be of catgut because it dissolves too quickly. We talk about ten-day or twenty-day catgut, but catgut varies so much. Some people digest catgut just as quickly as they digest an ordinary meal, and for that reason I never trust myself in doing any intestinal surgery without having amplified by a good strong linen Lembert suture.

DR. FRANCIS REDER, St. Louis.—In connection with these papers I desire to relate a case which occurred in my practice. A woman was brought to me on account of a "stomach trouble" which she had for a number of years. Pain and vomiting after eating was the principle feature of her case. Upon opening the abdomen, the gall-bladder was found well filled and free from stones. Adhesions were extensive and readily separated. A gastroenterostomy was performed. I was able to introduce my finger with some difficulty into the pyloric opening. The woman was in the hospital for two weeks, and during that time was free from pain and vomiting. She was hungry and able to eat. Five weeks after her discharge from the hospital she again began to have pain and vomiting and the clinical picture was precisely the same as the one before the operation. She again came to the hospital, and the afferent and efferent loops of the intestine were united. Again vomiting ceased, and the woman left the hospital within four weeks. Three weeks after returning home she was again taken back to the hospital on account of pain and vomiting and an exclusion operation performed by severing the duodenum at the junction with the stomach. This was about eight months ago. The woman has not vomited since nor has she had any pain. She is able to eat and appears to be relieved of her trouble. I have not been able to satisfactorily explain the disturbed mechanics in this case and for this reason should a similar case present itself I would feel justified to adopt the same surgical measures.

DR. ALBERT GOLDSPOHN, Chicago.—I would like to ask Dr. Crile whether he would do anything with a duodenal ulcer besides doing a gastroenterostomy. Would he invert the ulcer by stitches uniting the seromuscular coats externally without opening the lumen of the duodenum? Would he make a temporary occlusion of the pylorus, in such cases, and by what method?

DR. THOMAS B. NOBLE, Indianapolis.—With regard to benign stenosis at the pylorus, I am surprised that the work of Finney, of Baltimore, has not been mentioned in that connection. In my opinion Finney has given us an operation which meets the indications here most admirably. I will not undertake to describe his operation because I take it you are all acquainted with it. He opens the pylorus widely and gives permanent and free gastric drainage. This operation, of course, necessitates going into the lumen of the pylorus and duodenum. I do not see why men should fear such a procedure. Here in this locality infection is almost nil, and it is my belief that we may enter the lumen of the stomach in this region as we desire, and do almost any sort of plastic operation which will overcome the difficulty. Finney's operation does this, and in conjunction with it we are able to remove the ulcerating area as well. Finney splits the pylorus, the sphincter, and the upper end of the duodenum about midway between the superior and inferior borders, which in my

opinion can be better done by making an incision low down, so that when the margins of the lower limbs of the incision are brought together they will not form an obstructing shoulder which does exist in his operation. This shoulder is formed by the union of the posterior margins of the pylorus and duodenum.

I have had eight cases of this character in which I have used his operation, which I feel is a satisfactory method for this sort of stenosis, and certainly to me it is infinitely superior to an artificial, unnatural fistula established between the stomach and some portion of the intestine where nature never intended it to be.

Dr. Crile's insistence upon careful preparation of the patient is a matter of great importance. In a few instances of marked starvation I have had that impressed upon me, and I lost a case from postoperative acute mania as the result of long-continued starvation which might have been saved had I given more attention to that feature. Since then I have been able to overcome the difficulty by giving antecedent to the operation rectal nutrient enemata. I have had no experience with blood transfusion, but I have often used in this type of cases normal saline solution immediately before and during the time of the operation, which I feel is of very salutary benefit.

I wish to refer to two cases of perforated peptic ulcer in this region, in one of which the contents of the stomach entered the right upper quadrant of the abdomen where it had remained for thirty-six hours. In the other we had the contents of the stomach exuded at this point into the abdominal cavity for four days and nights. Salts, oils, and various things had been given, and these were found floating in the abdominal cavity. Both of these cases made good recoveries and are recited to illustrate the tolerance which the peritoneum has for gastrointestinal contents when coming from a point high up.

DR. GEORGE W. CRILE (closing the discussion on his part).—I am much interested in Dr. Keefe's paper. In a patient having congenital obstruction and on whom I had performed a gastroenterostomy, the abdominal wound broke open because of a nurse's mistaking plain catgut for chromic. The child was emaciated and reduced at the time of operation. This added strain would have been fatal but for a blood transfusion. The child is now four years old and healthy.

I usually protect a duodenal ulcer by plicating the pylorus, but as far as possible I excise gastric ulcers—partly because they are not with certainty cured by gastroenterostomy and partly because a cancer may develop at that point. If I knew the ulcer was situated in the cardia before operation, I do not think I would do a gastroenterostomy. I would do no operation until the patient was urged by some great extremity to require it. If I did operate, I should do the Von Eiselberg operation by performing a jejunostomy and allowing the stomach to have absolute rest for a period of four or eight months.

DR. KEEFE (closing the discussion).—Dr. Carstens spoke of having had some difficulty in cutting partially through the stomach wall and endeavoring to avoid the mucous membrane, by only cutting through the muscular wall. It would seem that he has an entirely different proposition to deal with from what we have in these cases where we have a pyloric tumor. If we have a small cartilaginous mass it does not cut like muscle at all; it cuts like connective tissue, so I think we will have no difficulty in going through the peritoneum and cutting through the cartilaginous mass, because the mucosa looks so different.

Dr. Noble spoke of Finney's operation. I have not been able to find a single case where the Finney operation for the cure of stenosis, that is, congenital pyloric stenosis, was indicated. Here again we have a different situation to contend with. I think the Finney operation, as first advocated by him, is too extensive for these little subjects. They weighed about 6 1/2 pounds, and the small intestine or the duodenum perhaps was not larger than the first joint of the little finger, and the walls are delicate and thin, and Finney's operation to my mind would be out of place in this type of case. Any man who has employed it, and every surgeon who knows about it, realizes that it would be an undesirable operation in these cases. We are in the habit of doing gastrojejunostomy on the adults so frequently that there is a tendency in this type of case to employ it. To my mind the other operation is simple, and it is decidedly better than to have to employ a more extensive operation, and the average mortality from gastrojejunostomy is about 50 per cent., and with men operating for the first time, it seems to me even with divulsion, which seems more crude with forceps, there will be better results than with gastrojejunostomy. While gastroenterostomy is more of a fad to-day, yet it should not be employed in this type of case.

## A LARGE CALCAREOUS FIBROID WITH ABSENCE OF OVARIES AND UTERINE LIGAMENTS.<sup>1</sup>

BY

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(With Three Illustrations.)

SUCH anomalies as congenital malformations, displacements, double uterus or vagina, absence of one or both ovaries, vagina or uterus, or even absence of all the female generative organs, have been from time to time noticed and reported. Even though these phenomena are so comparatively rare, owing to the greatly increased number of operations upon the pelvic

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

organs and our increased facilities for determining the causes of morbidity, these conditions should be borne in mind as the



FIG. 1

possible causes of symptoms that might otherwise be very obscure. A case which occurred in my practice a year ago

seemed to be of unusual interest on account of the absence of all the uterine adnexa and where the growth of a large tumor had been supported apparently for many years by the scanty blood supply that entered it through two small arteries from the sheath of the vagina.

The patient was a violently insane single woman about sixty-



FIG. 2.

five years of age who had been an inmate of the Hudson River State Hospital for the Insane about one year. Practically no previous history could be obtained. Her insanity had been classified by the staff as a senile psychosis. It was noticed by the hospital physicians that she had some form of abdominal tumor, but owing to her mental condition it had been impossible



to form any idea as to its nature by questioning and any physical examination could only have been made by sheer force or under an anesthetic. This did not seem to be warranted until September 2, 1911, when she was seized quite suddenly with an attack of severe abdominal pain.

I was called in consultation with the staff physicians and under anesthesia we found a large, hard, unyielding mass



Fig. 3

occupying most of the abdominal cavity, but harder and more prominent on the right side. Through the vagina there appeared to be a soft pulpy mass between the examining finger and the unyielding and apparently immovable mass above. A median incision through the thin abdominal wall disclosed a large blood red mass, studded here and there with calcareous nodules

and having upon its left side, extending down into the pelvis, a blood red soft uterus which was the pulpy mass felt through the vagina. Upon the uterus were two irregular projections which could be easily recognized as the Fallopian tubes, also very much enlarged by vascular engorgement.

When the incision had been made sufficiently large I found that I was able to lift the whole mass out of the abdomen and it dropped over the side of the pelvis, attached apparently only by a comparatively thin pedicle. Upon closer examination I found that this pedicle was simply the vaginal sheath and that there were no other attachments. The bladder was not attached by either peritoneum or uterovesical ligaments. Neither was there any trace of ovaries, broad, or round ligaments. To make sure of the pedicle, a large sound which was introduced into the vagina readily passed up into the pedicle, which, due to the weight of the tumor, had stretched to at least 3 inches in length. The pedicle was then separated, the edges inverted and sutured, after ligating two small arteries, the only blood supply to the whole mass.

The abdominal cavity contained a considerable quantity of bloody fluid, which was carefully sponged away, and the abdomen closed. Operation had no effect upon the patient's mental or physical condition, which, from a report from the hospital a few days ago was unchanged, one year after operation.

Dr. H. P. Carpenter, pathologist at the Hospital, examined the tumor and reported as follows:

"The tumor consisted of a large calcareous fibroid, the uterus and its tubes. The uterus was much enlarged, measuring 9 cm. transversely at its broadest point. The entire wall was soft and diffused with blood. The Fallopian tubes were also enormously thickened and infiltrated with blood. The tumor itself sprang from the right side of the uterus and measured 12 cm. in breadth, 10 cm. in thickness, and 20 cm. in length. On section it was composed of a fibrous capsule which was injected, enclosing an oval mass of calcareous material, somewhat mixed with fibrous tissue. At the junction of the tumor and the uterus there was a mass of engorged blood-vessels and small gelatinous cysts."

Was this condition necessarily congenital, or had it been brought about by pathological changes? In quite a considerable number of operations done upon this unfortunate class of patients, I have noticed that a comparatively large number of

them are found to have imperfectly developed genital organs. Many of the young women have infantile uteri, small, imperfectly functioning ovaries, while uterine retroflexion or retroversion, or both, is almost a rule. Many of the older women are victims of uterine fibroids, severe lacerations or procidentia uteri, with its accompanying cystocele, etc. Now, if in the case I have reported this condition was caused by pathological and premature senile changes, might not a simple operation for the removal of the offending fibroid at the proper time have saved this woman, not only from the condition in which we found her, but also have saved her from an asylum for the insane.

339 MILL STREET.

## ILEOSIGMOIDOSTOMY FOR COLONIC STASIS.<sup>1</sup>

BY

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ABDOMINAL surgery has reached its present status by a process of evolution and Ephraim McDowell was its father. For many years the operation with which his name is connected was the only intraabdominal operation undertaken by surgeons. Mistakes in diagnosis occasionally led to a fibroid being removed and mistakes in diagnosis finally led to the operative treatment of tubercular peritonitis. But after Lister discovered the cause and method of prevention of surgical infection, pelvic surgery made rapid strides.

Lawson Tait showed the feasibility of removing pus tubes. Baer of Philadelphia perfected the technic of supravaginal hysterectomy, which made operations for fibroids comparatively safe. After gynecologists had demonstrated the way to deal surgically with these intrapelvic conditions, it was perfectly natural that other parts of the peritoneal cavity should be invaded by the surgeon.

Fitz of Boston demonstrated the true nature of appendicitis and suggested its surgical treatment, and it was not long until the troublesome little organ was being extirpated by scores and hundreds of operators. The gall-bladder likewise offered a

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fertile field for the surgeon. The first operation for gallstones was performed by Dr. Bobbs of Indianapolis in 1867, but it was not until abdominal surgery had become well established that surgical treatment of the gall-bladder was resorted to with any degree of frequency.

Next the surgeon naturally directed his attention to gastric and duodenal ulcers and to perforations of the small intestine from typhoid ulceration. As in the early days of ovariectomy tumors were only operated on when they became a serious menace to life, so in the earlier days of operations on these various organs, the appendix was only removed when it was thought the patient could not otherwise survive. The gall-bladder was only invaded after months and years of suffering had convinced the medical attendant of the futility of further drugging, and the operation for ulcer of the stomach was only undertaken when a perforation made death inevitable without surgical aid. But experience has taught surgeons to be more radical and the medical men less conservative in treating these conditions. The skilled abdominal surgeon now invariably examines the appendix and gall-bladder when the abdomen is opened for any cause, and if either shows marked evidence of disease and the condition of the patient will permit, he at once deals with them in a surgical way. Ulcer of the stomach and duodenum not yielding to medical treatment and dietary in a reasonable length of time are submitted to the surgeon while they are in condition to be fair surgical risks.

The success of surgeons dealing with these conditions (stomach and bowel) led to the extending of their operations to other conditions which had for ages been considered purely medical in character. The success of the gastroenterostomy in relieving conditions in which the mechanical obstruction was at or near the pylorus, led to its employment in those cases in which the stomach is prolapsed and dilated.

The results obtained from this operation in the latter class I think on the whole have been disappointing. Mr. Lane of England long ago pointed out that in these cases there was also a ptosis of the transverse colon, and more or less of all the intestines, and that the ptosis of the colon leads to the formation of adventitious bands of peritoneum causing kinking of the ileum a few inches from its entrance into cecum and of the colon at its hepatic and splenic flexures. In this way the condition which has been designated as colonic stasis arises.

The primary symptom of this condition is obstinate constipation. Ordinarily the patient will not have a movement of the bowels without the use of purgatives and as time goes on it requires larger and larger doses of drastic drugs to produce the desired effect. The patient is poisoned by the absorption from the clogged sewer which the colon has become. She suffers more or less constantly with ill-defined pains in the abdomen. Her skin becomes muddy in appearance. The action of the heart is irregular. Here eyes lack luster and have a semidazed expression. Digestion is slow and oftentimes painful. Frequently the breasts undergo a cystic degeneration. She becomes a pronounced neurasthenic. She will occasionally improve under the stimulation of new environment or a change in her medical attendant, but the benefit is only of short duration.

No belt has been devised that will hold the displaced organs in position. No drug that will restore tone to the overdistended viscera. Surgery seems to offer the only hope of a permanent cure.

The use of the bismuth ingestion and the *x-ray* have been of the greatest benefit in studying these cases. By this method one can see how long it takes the stomach to empty itself, how long the bismuth takes in passing through the small intestine and the length of time required for its passage through the colon. Moreover, the size and the location of the stomach and transverse colon can be accurately seen.

The use of the *x-ray*, however, must go hand in hand with the careful study of the history of the case and the symptoms manifested to a competent clinician. Just as the pathologist in using his microscope is a great aid in verifying the diagnosis of the clinician, he will seldom risk making a diagnosis from a microscopic picture alone.

In some of the cases in which the *x-ray* shows a marked displacement of both stomach and colon we will find these organs functioning very well, the symptoms certainly not being of sufficient severity to justify any judicious surgeon in advising surgical treatment.

If surgery is demanded two entirely different procedures suggest themselves. The first is to endeavor, by giving the displaced organs some additional support, to keep them in approximately their normal position. This is attempted by fastening the mesocolon and omentum to the abdominal wall by sutures or the stomach and colon themselves, the idea, of

course, being the same as in a ventral suspension of a prolapsed or retroverted uterus.

There are some objections to this procedure. In the first place the adhesions formed are not always of sufficient strength to maintain the displaced organs in the required position.

In the second place such attachments have led to complete obstruction of the bowel and in the third place, in some cases the colon is so elongated that to fasten it up would be to simply create a number of small loops instead of one big one, and as each loop will have an angle or kink, the utility of such a procedure is certainly questionable.

The second procedure consists in short circuiting the bowel. A railroad that has been built for a number of years may find that to handle its business satisfactorily, it is necessary to eliminate some of its curves and lessen some of its grades. Just so the intestinal tract of the adult human being may have become so elongated and distorted that the curves and grades are too great for the motive power, and in order that the fecal matter may be evacuated in a reasonable length of time it is necessary for the route to be shortened and the grade made easier.

The operation devised by Mr. Lane consists in cutting the ileum in two at a point a few inches from its lower termination. The short end of the ileum is securely closed and the other end is anastomosed with the sigmoid flexure somewhat below the most prominent part of its curve. When the operation is done the contents of the small bowel are emptied near the lower instead of the upper end of the large bowel. The ascending, transverse and descending colon are thus put entirely out of commission.

Mr. Lane, who has done a large number of these operations, finds that if the ileum is attached below on the sigmoid flexure, there is usually no return flow of fecal matter into the descending colon. In only about 7 per cent. of the cases is there a backflow, and it then becomes necessary to reopen the abdomen and remove the colon.

It is not advised that this be done in any case at the primary operation, because it adds much to the gravity of the same and is usually not necessary. Furthermore, if it has to be done finally, the patient, having been more or less completely relieved for a number of weeks or months, is in a better condition to stand such a radical procedure and the blood-vessels in the mesentery supplying a bowel that has not been functioning for a considerable



length of time, are not so troublesome as they are when the bowel has been performing its usual duties.

It has been urged against this procedure that it is unnecessarily severe. That it is too severe for minor cases cannot be denied, but no operation is too severe that will give relief to the worst cases, unless it has a prohibitive mortality, and this is not true of this operation in the hands of anyone experienced in abdominal surgery.

Secondly, it was feared that such patients would not have control over their bowels. This fear has not been realized as far as I know by the experience of any operator. The patient usually has two or three stools, more or less formed, in twenty-four hours. My own experience with this operation is limited to six cases. All of them have been operated on within the last six months.

CASE I.—The first patient I saw with my friend and colleague, Dr. Carothers. She was thirty-one and unmarried. Up to the age of twenty her health was comparatively good, with the exception of painful menstruation, for which she was twice cureted without relief. At the age of twenty-eight the abdomen was opened and the left ovary and appendix removed. After this her health was only fair, headaches and ill-defined pains continuing for which she consulted internists, orthopedists, oculists and rhinologists. When I saw her she was absolutely unable to work and manifested in a marked degree all the symptoms of colonic stasis. She was afraid to eat on account of the difficulty experienced in evacuating the bowels.

We opened the abdomen with the intention of fastening the colon to the abdominal wall. When we found how long the colon was, it appeared to both of us that this would be a useless procedure. The colon in this case was very much diminished in caliber, being decidedly smaller than the usual small intestine. The ileum was severed at the usual place between rubber covered clamps. The ends were sponged off and rapidly closed with continuous sutures of chromic catgut which controlled all oozing. The ends were then inverted and a row of fine silk sutures inserted.

The long end of the ileum was then carried over to the sigmoid flexure and a lateral anastomosis was made as near the ends of the ileum as could conveniently be done. A suture or two fastened the mesentery of the ileum to that of the sigmoid flexure so as to render it impossible for a coil of intestine to pass behind the anastomosis.

Mr. Lane does an end to side anastomosis, but I chose the lateral method because it was more easily done and the lateral anastomosis has given a lower mortality in the hands of most operators than either the end to end or end to side.

Before the operation this case had not had a stool without the use of purgatives for over five years. On the third day following the operation the bowels moved of their own accord and continued to do so up to the present time. For the first week the stools were rather too frequent and loose and irritated the skin around the anus. Since that time the condition of the bowel has been quite satisfactory. The patient has gained 15 pounds, has been following her work as a hairdresser and solicitor. Her skin has cleared and her general health improved in every way.

CASE II.—Mrs. S. came to me on account of "stomach trouble." She had constant pain in the abdomen and was absolutely unable to work and I could scarcely get her to take enough food to nourish her, on account of the distress it gave her. Her bowels only moved when given violent purges. After a month's observation and treatment I advised operation and she immediately consented. The operation was performed as in the previous case. Her bowels moved on the third day of their own accord and for a short time were rather too loose.

Within a week she was eating better than she had for years. Once since she went home she has been somewhat constipated, but I think it was due to large quantities of milk she was taking. Her colon like that in the preceding case was of very small caliber.

CASE III.—This patient came to me for laceration of cervix and perineum, but complained of symptoms in the abdomen that could not be accounted for by this condition. I had x-ray pictures made by Dr. Sidney Lange, which demonstrated ptosis of the colon and I advised her to let me perform this operation when I repaired the lacerations. The operation was performed as in the preceding cases. The colon was exceedingly long, but more normal in caliber. Her bowels did not move until the fourth or fifth day, and then assisted by a small enema. They are now moving freely and her stomach is behaving very well.

CASE IV.—Miss G., age thirty-three, menstruation began at about the age of fifteen. Was irregular for the first year, later it became regular and was painful. She had suffered from constipation as long as she could remember. She complained of ill-defined pains in the abdomen. She had periods of the most profound melancholia and fits of uncontrollable temper. She had worked at dressmaking but had been compelled to give it up on account of her health. She was treated by a general practitioner of ability, but he diagnosed her case as hysteria and treated her without sympathy and without benefit. She was seen in consultation by one of the most popular neurologists in Cincinnati who confirmed the diagnosis of the general practitioner. His suggestions as to the treatment were without benefit. Her mental condition was getting worse. I saw her in consultation. Physical examination showed the uterus not well developed, with a long, narrow cervix, sharply anteflexed. A fibroid the size of a hickory nut was present in anterior wall of uterus. I advised a thorough dilatation of the cervix, curetage and pack-

ing of the uterus followed by several weeks' rest in bed in a hospital.

The fact that I said there was a physical basis for her symptoms and outlined a definite line of treatment, secured her confidence. She was cured at the Good Samaritan Hospital, Jan. 15, 1912. She immediately improved and made every effort to get well. Her bowels remained constipated. If they were not permitted to move for several days her symptoms, especially the melancholia, threatened to reappear.

The large doses of purgatives necessary to move the bowels exhausted her. After two weeks in the hospital I saw that I could not improve her condition any further by rest and changed surroundings. She was sent home and ordered to walk several squares every day, eat large quantities of fruit before breakfast, and take a cold sponge bath every morning. Several times a day she was to exercise by bending forward till her fingers touched the floor and then straightening up. Under this régime she about held her own but made no further progress. It took about ten grains of compound extract of colocynth with five of cascara to move her bowels.

Dr. Dudley Webb made x-ray pictures of stomach and intestines, showing ptosis of colon and slow motility. She returned to the hospital and May 22 I did an ileosigmoidostomy and also removed the small fibroid.

Her bowels moved on the third day without a purge. For a few days they were a little too loose but since that time they are all right. She was in my office within the last ten days. She is the picture of health. Skin clear, eyes bright, a constant smile on her face and she has gained about 20 pounds in weight.

CASE V.—Mrs. N., wife of a physician, entered Christ's Hospital, May 22, 1912. She had been troubled with obstinate constipation for twelve years. She was melancholy, and trifles brought on nervous attacks that would compel her to go to bed. The x-ray showed ptosis of colon and stomach. She was operated on May 25. She did not do well from the start. There was some elevation of temperature, scanty urine, and the bowels only moved after a purge was given. She died of pneumonia, June 12, eighteen days after the operation.

CASE VI.—Mrs. G., aged thirty-five, mother of two children. During entire married life her health had only been fair. Had had headaches and ill-defined pains over body. She consulted me on June 19, and entered the hospital (Good Samaritan) the same day. She was operated on the following day. Her recovery was uneventful, and she left the hospital for home June 18. I was talking to her husband a few days ago in my office. He tells me she has gained in weight, her bowels are moving regularly, and her general health is much improved.

One death in six cases is a high mortality rate, but judging from the very smooth recovery of the other five, this is not what the rate will be when the series of cases is larger. I believe any

other intraabdominal operation would have led to this woman's death, and that it should be attributed to the operator, but not to the operation.

This very interesting subject is still in its infancy, and I offer this paper as a slight contribution to its study, believing that in a comparatively small number of severe cases this operation will bring relief that cannot otherwise be obtained.

409 BROADWAY.

#### DISCUSSION ON THE PAPER OF DR. BONIFIELD.

DR. GEORGE VAN AMBER BROWN, DETROIT.—In connection with the cases described by Dr. Bonifield, I wish to report a case along this line which occurred in my practice. I presume nearly every operation has been done for the correction of epilepsy. Last winter a woman twenty-eight years of age, an epileptic, was referred to me. She was in a very bad condition and was having several convulsions daily which would come on at any time or place so that it was necessary to have some one attending her constantly.

I took her to one of our neurologists, who examined her carefully and said he could do nothing for her. She had been married eight years, had never been pregnant, was a victim of chronic constipation and general digestive trouble. Seven or eight days would elapse between bowel movements. In view of this, I suggested that an ileosigmoidostomy might afford relief, which suggestion was approved by the neurologist. The patient and her husband agreed to, and were anxious to have the operation done immediately. However, I kept her under observation for ten days before operating. I gave her a bismuth meal of six ounces subcarbonate of bismuth, following which an x-ray was taken. It was only a few moments before the bismuth left the stomach and ran into the small intestine. I understand this is a common occurrence in neurotic individuals of any type. The bismuth was watched by x-ray pictures taken every hour or two from morning until evening. It passed rapidly down to the colon and there it stayed, there being a pronounced coloptosis. The next morning the bismuth was still there; forty-eight hours later it was there. I did a lateral anastomosis of the sigmoid with the lower end of the ileum, but did not disconnect the one portion of the ileum from the other, taking a portion from a few inches above the cecum and attaching it at this point (indicating), leaving an opening 3 inches in length. After the fifth day she had normal movements of the bowels. During the first week, about the fifth day after the operation, she had one convulsion after which she made an uneventful recovery. She was able to leave the hospital at the end of the third week. I then for a time lost track of the woman. Four months after the operation I received a letter from her

husband stating that she was so well that she did not think it necessary to come to see me, that she was not having any more epileptic attacks and that her bowels were moving regularly every day. I simply report this for what it is worth.

DR. FRANCIS REDER, St. Louis.—I have been very much interested in the case of stasis of the bowel related by Dr. Brown. It requires a great deal of mental tact to keep the alimentary tract in a physiological condition. With the operative measures that have been instituted most of the physiological dynamics have been overthrown. After what has been said, there is nothing surprising in abdominal surgery. I am gratified to know that the doctor obtained such an excellent result from the operation which he performed in this case, relieving the epilepsy. If we go back to the principles of hygiene, we must bear in mind that in some of these cases the bowels, instead of harassing them with cathartics, need proper physiological rest. A good drink of water upon rising, and the necessary exercise is all that is necessary to correct the condition in many instances. However, we must not lose sight of the fact that operative measures are very beneficial in certain instances and are to be recommended.

DR. BONIFIELD (closing the discussion).—I want to add one remark that I failed to make on account of lack of time. I reported one death, which I regard as due to the operator, and not to the operation. We all have accidents at some time. Just what occurred in this case I do not know. She did not do well from the start, but judging from the five other cases, the mortality of the operation ought not to be greater than from any other intraabdominal operation. The other five had uneventful recoveries. This particular case was not a good surgical risk. She was an old woman who put up no fight at all. She went bad from the start, and, as I reported, died the eighteenth day from pneumonia. I could not get a postmortem examination. I succeeded in getting her bowels to move. The anastomosis was all right. There were no evidences of peritonitis, and yet I believe there was some sepsis in the case. I would not advise this operation for a minute if I thought it would have a mortality of 16 per cent. But I believe, as I stated, this was an accident, and that one ought to operate on these cases with a mortality of probably about 5 per cent. This is not a prohibitive mortality in these severe cases. I would not for a moment operate on a case that had not been treated for a long time by the internist or by some one in whom I had confidence, and most of these cases I kept under my own observation. Two of them, if you remember, were kept under observation for a month. The operation is not difficult, and ordinarily the patient is made comfortable a day or two afterward, and I believe the operation has a future.

A CASE OF UTERUS SEPTUS WITH HYPEREMESIS GRAVIDARUM, INTERRUPTION OF PREGNANCY AT THREE AND ONE-HALF MONTHS, FOLLOWED BY PERITONITIS. RECOVERY.<sup>1</sup>

BY

H. WELLINGTON YATES, M. D. AND PLINN F. MORSE, M. D.,  
Detroit, Michigan.

(With Nine Illustrations.)

CASES of anomalies of the uterus are being so commonly reported and the mechanism of their formation is so well understood that the main interest which now attaches to them is a clinical one.

It will be remembered that the tubes, uterus, and vagina are developed from the Müllerian ducts and that these two ducts become fused, except the uppermost parts, which go to form the Fallopian tubes. The varieties of malformation encountered are, therefore, very numerous and depend upon the extent to which development and fusion of the two parts, which should become blended, fail (44).

The complications and accidents of pregnancy to which women with double uterus are especially liable, deserve careful study and accurate observation. Since the first reports of the malformation by Kussmaul (24), who found it in stillborn infants, many careful observations have been made relating to the etiology. Bell (5), in a report of a case of double uterus with ectopia of each in an inguinal hernia, shows that failure of the Müllerian ducts to fuse depends largely on a deficient formation of the uterosacral musculature and also the decussating subperitoneal muscle fibers which normally form the external coat of the uterus. Contributing causes are a short genital mesentery and hypertrophied round ligaments which, if short, tend to drag the ducts apart.

The clinical observations, which are very numerous, tend to make the cases fall into several classes according to the age of the patient, the kind and extent of the malformation, and the complicating conditions.

From a perusal of the literature, it is evident that cases of double uterus with both uteri equally developed and normal, are

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



rather rare. Usually there is at least one side which shows marked atresia and gives rise to abnormal symptoms and signs under certain conditions to be discussed later. Cramer(3) reports a case of complete double uterus in which pregnancy took place simultaneously in each side, labor came on independently in each uterus and was completed without mishap except severe postpartum hemorrhage. Such cases are, however, rarely seen,

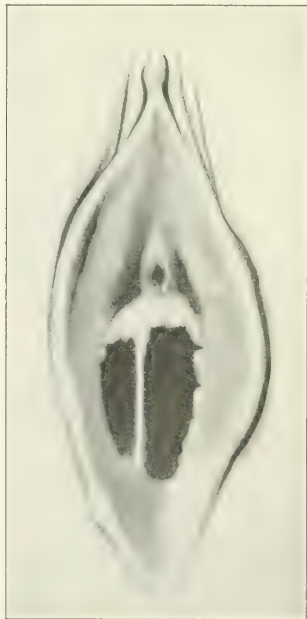


FIG. 1

although it has been suggested that many cases of double uterus go through a normal childbearing life without ever being detected. Usually the cases fall into the following groups:

*A. Those Consulting the Physician at Puberty for Abnormal Menstrual Phenomona.*—These cases, of which twenty-three had been collected by Durlacher(14) up to 1909, come to the physician

complaining of pain and swelling at the menstrual period and with or without menstrual blood showing, dependent upon whether both sides or one is atresic. Examination shows hematometra on the defective side. Sometimes this breaks through spontaneously.

*B. Those Showing Purulent Processes in the Atresic Half of the Uterus.*—These cases are much rarer. Breisky (28), Sicherer (29) Peham(30), Gusserow(31), have reported such cases. Just

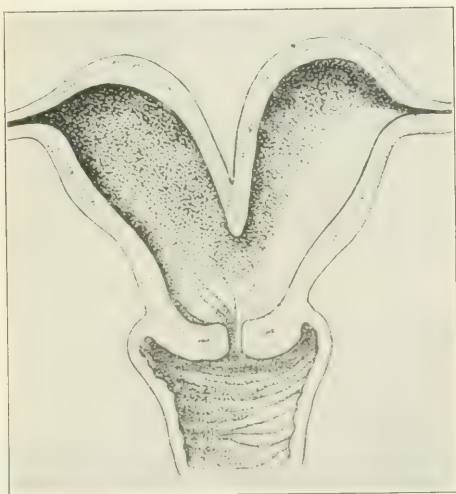


FIG. 2.

why, in the absence of instrumentation or evident inflammatory pelvic disease, these atresic uteri should become so easily infected is not clear. Gusserow's case was pregnant on the fully developed side. The occurrence of pyometra and pyocolpos in cases of double uteri is very important and interesting. They show the value of routine careful pelvic examination in cases with fever and other septic manifestations. The blood count is high, and there are definite symptoms of infection without the true condition being discovered until peritonitis has closed the scene and autopsy revealed the pathogenesis.

*C. Cases with Pregnancy Occurring on one or Both Sides.*—When the pregnancy occurs in the atresic half, some mishap is almost sure to supervene and the physician should have diagnosed the condition of double uterus early and kept the patient under constant supervision. These cases of double uterus complicated by pregnancy form by far the largest and most important group. The pregnancy may not be suspected by the patient for some months owing to a normal menstrual flow from the other side,

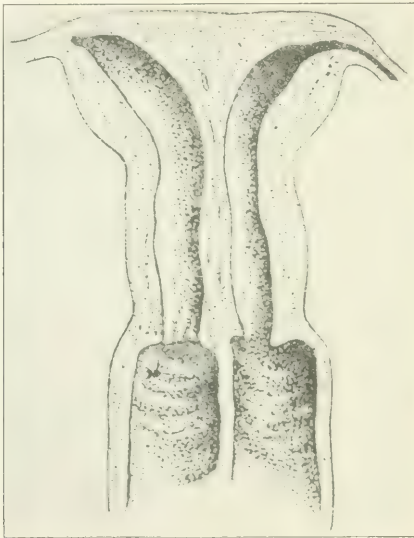


FIG. 3.

as in the case reported by Cunningham(22). Severe recurrent hemorrhages, especially occurring at the normal menstrual time, cause the cases to be confused with ectopic pregnancy or placenta previa. Masterman(11) delivered a woman after bringing on labor artificially at the seventh month, because of very severe hemorrhage recurring at the fifth, sixth and seventh months. There was also severe postpartum hemorrhage. This patient subsequently became pregnant in both uteri and aborted at the

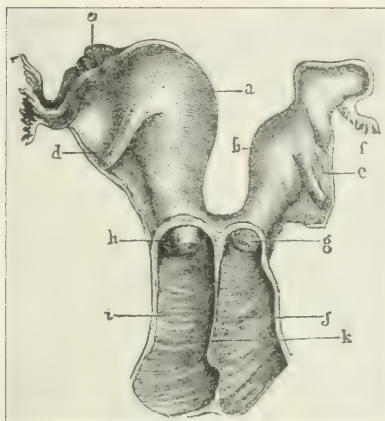


FIG. 4.

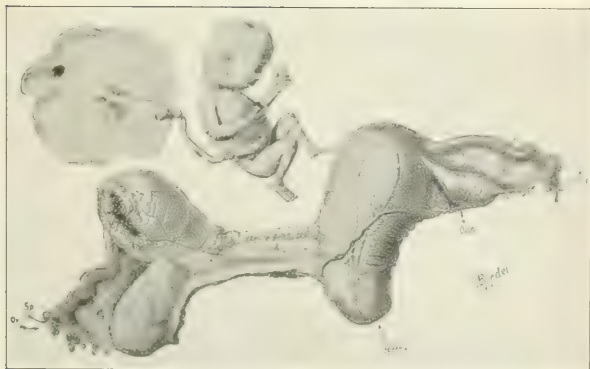


FIG. 5.

fourth month. The danger of infection in these cases seems to be very great and extreme care should be exercised in any operative procedure upon them.

The necessity for early recognition of pregnancy in all anomalies of the genital tract is obvious and to this end we should persistently endeavor to educate the laity to seek counsel of their physician as soon as conception is suspected.

In a certain class of anomalies where the divergence from the normal is not marked, gestation may continue to term and a



FIG. 6.

fairly normal labor result in a living child, but in that class of cases which is met with not uncommonly, namely, those which become pregnant in a rudimentary horn, seldom, if ever, can go to term, since the muscular development is as immature as the parts are morphologically incorrect. As Williams(45) says, "unless there is free communication between the two horns, which is but rarely the case, a pregnancy in this situation is a very serious occurrence, since normal delivery is impossible. If the muscular tissue of the rudimentary horn is poorly developed,

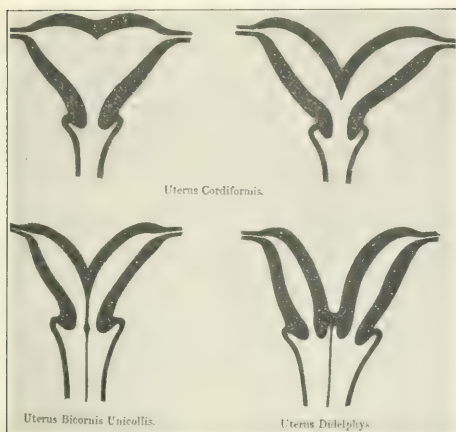


FIG. 7.

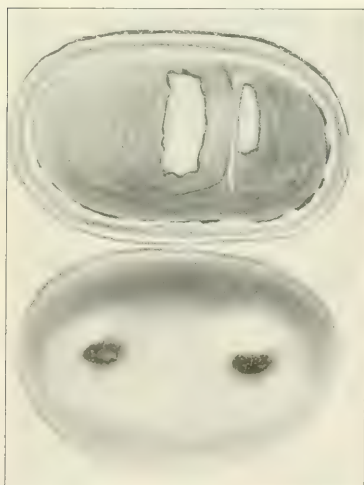


FIG. 8.



as is usually the case, spontaneous rupture occurs within the first four months and may lead to the death of the patient from intraperitoneal hemorrhage."

Recognition of this kind of anomaly during pregnancy is scarcely ever possible unless the patient is seen early. Diagnosis of pregnancy is made difficult in all forms of double uteri, complete or otherwise, because of the accompanying hypertrophy of that portion not involved.

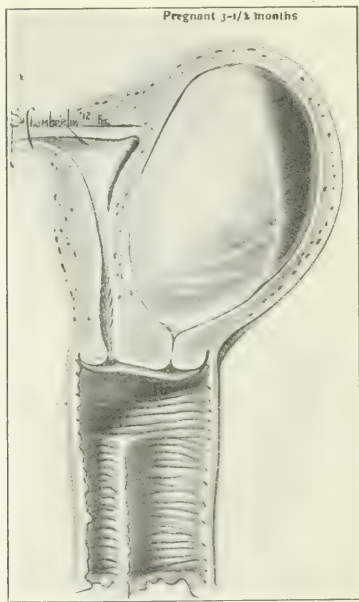


FIG. 9.

On Feb. 6, 1912, I was called by Dr. J. H. Sanderson of Detroit, to see Mrs. S. D., and elicited the following history. She had been pregnant for three and one-half months. Very early in her pregnancy she showed persistent nausea which progressed to a true hyperemesis gravidarum in spite of all treatment that could be instituted. She had lost much weight,

was confined to her bed and unable to retain the least nourishment. Her condition was so grave that Dr. Sanderson felt it incumbent upon him to empty the uterus, which he did on the day preceding my call. On the evening of that same day she showed signs of serious illness. Her pulse became weak and temperature elevated, she had abdominal pain and a moderate tympany. I was called so see her along with Dr. A. N. Collins, on the afternoon of the following day. The patient showed all the classical symptoms of a diffuse peritonitis. She looked desperately ill, her pulse was 150 per minute, small and easily compressible, her temperature 102° F., and she vomited brown fluid in a projectile manner. Her abdomen was generally sensitive to touch and markedly distended. Her mental attitude was one of great anxiety. She had a leucocyte count of 21,000, with a differential of 85 per cent. The following morning (forty-eight hours after the uterine evacuation) with a condition worse rather than better, with the leucocytes having gone to 30,000 and the differential count to nearly 90 per cent. of polymorphonuclears, I advised an examination under an anesthetic with a probable posterior colpotomy. Under ether and by aid of good light and position, it was seen that there was a partial double vagina, on the left side fully matured, but on the right rather small and separated from the left by a septum running anteroposteriorly for about 2 1/2 inches upward, ending above this point in a common vagina. The cervix was rather large and oval with a distinct septum dividing its vaginal view, with an os on each side. A blunt instrument introduced into each canal simultaneously with the endeavor to make their upper ends touch, failed to do so and thus we concluded that the uterine septum was complete.

The accompanying illustrations taken from standard texts along with the original ones of my own case are offered in brief review.<sup>1</sup>

The left uterus was free from débris. Since we ascertained that it had not been punctured by former manipulations, we believed it probable that the right side was pyometric and from this source came the infection. As we said in the early part of this paper, it would be intensely interesting to know the causes

<sup>1</sup> Attention should be especially called to the fact that within twelve hours of the interruption of the pregnancy, peritonitis was fully developed, making it probable that the infection antedated the instrumental interference. The liability to cryptogenic infection in the atresic half of these uteri was pointed out in referring to the literature.

of these cases of pyometria associated with pregnancy in the anomalous uterus. After the examination was completed, a colpotomy was done and a large self-retaining drainage tube inserted. One liter or more of dark brown, fetid, thick fluid escaped. The patient was kept in the extreme Fowler's position for a few days. She made a rapid and uneventful convalescence. The drainage was removed in two weeks.

Besides the interest surrounding the malformation in this case we are inclined to urge early colpotomy in all cases where extensive and frank peritonitis is present. Done cleanly it can do no harm and done early it will save many lives. It is quite probable that this patient under more normal gestational conditions might have borne a living child at term without great injury to herself, and it is much more certain that she would have died without the vaginal section being done. We have since censured ourselves for not doing it at our first call.

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- 360 FORT STREET, WEST.

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## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON OBSTETRICS AND GYNECOLOGY.

*Meeting of October 24, 1912.*

FRANKLIN A. DORMAN M. D., *in the Chair.*

DR. JAMES A. HARRAR read a paper entitled

WHEN IS THE HIGH FORCEPS OPERATION JUSTIFIABLE?\*

#### DISCUSSION.

DR. WILLIAM S. STONE believed that Dr. Harrar had given a very fair presentation of his subject "When is the high forceps operation justifiable?" There were one or two points he wished to emphasize. He recalled very well his first case in which this operation was attempted and the forceps were applied three times. One should have an exact idea as to the relation of the head to the pelvis in order to determine whether or not the forceps should be used. It was fortunate that in his early experience he was taught by the late Dr. Tucker the high forceps operation. In many of these cases if a keener diagnosis had been made craniotomy would have been resorted to. A very important point related to the making of the diagnosis and the indications for high forceps operations. After hearing the paper one was struck by the difficulty of doing the high forceps operation; this operation was more difficult than was ordinarily believed and should be carried out only by men who were specially qualified to do this work. A very important point Dr. Stone received from the late Dr. Emmett was to apply the forceps

\*For original article, see page 217.

whether the head was high, median or low when there was flowing; in other words no matter where the head was when it became stationary, not receding at all between the pains, the forceps should be applied and without waiting.

DR. SIMON MARX asked what was meant by high forceps operations. What was given in the text-books was misleading. The head above the brim of the pelvis did not always require a high forceps operation. In many of the cases they saw, if they waited awhile, the head would engage; if the head did not engage there were two reasons; the head was too small or too large, causing a malposition of the presenting part. If the condition was recognized early, the malposition could be corrected and the high forceps operation would not be necessitated. With advancing experience the high forceps would be less used.

DR. SIDNEY D. JACOBSON said Dr. Harrar must be congratulated upon his skill in debating this question which at best meant the leading of a forlorn hope. Much has been made by various authors of the value of the Walcher position in slight pelvic contraction. He could not agree with Dr. Harrar upon this point and believed that the Walcher position was not of much practical importance. Walcher himself claimed only an increase of about  $1/2$  centimeter in the length of the conjugate by hyperextension of the thighs. Usually only a few millimeters were added to its length in this way and that surely could not be of much practical use.

Furthermore he took issue with him upon his statement that pubiotomy could not be regarded as a method of delivery in contracted pelvis, but that it was rather an aid to the forceps in delivering the patient.

It seemed to him that Dr. Harrar was "putting the cart before the horse." Pubiotomy was well able to accomplish delivery in a contracted pelvis even without the aid of forceps, but forceps would fail in contracted pelvis to accomplish delivery without pubiotomy. So the argument did not apply.

DR. FRANKLIN A. DORMAN said that his interpretation of the high forceps operation was that it was one that lasted a shorter length of time than was suggested by Dr. Marx. Where there was a larger circumference and with the head above the pelvic brim and not engaging, the high forceps he thought was indicated. As he understood what was discussed, Dr. Marx condemned the high forceps whereas Dr. Harrar was very anxious to introduce any excuse for doing it. It was fair to say that there were positive indications for doing this operation but the work should be in the hands of a competent operator.

DR. J. A. HARRAR closed the discussion. Following Dr. Stone's suggestion he thought that most of the questions raised might best be answered by rereading the paper with a little more emphasis. He had been prompted to write on the subject of high forceps because since the enlargement of the field for Cesarean section, it was becoming the apparent teaching that high forceps



was no longer a justifiable operation under any circumstances. Also by discovering how poor his results had been with version in the treatment of contracted pelvis as compared with the use of high forceps, especially with regard to the infant mortality. The general practitioner was very much addicted to the operation of version, probably because it required no instrument but the hand, and was prone to believe his results better than was really the case.

Craniotomy of the after-coming head in version for contracted pelvis was a too frequent occurrence and showed poor judgment on the part of the operator in the selection of the method of delivery. He was pleased to hear Dr. Marx bring out the point that craniotomy on the living child was occasionally justifiable, and in many instances a life-saving procedure for the woman. This was especially so where it was too late to do a Cesarean section. With either a dying or a dead child it was highly improper to do either a forceps or a version, but proceed at once to craniotomy.

DR. GEO. W. KOSMAK read a paper entitled,

IMMEDIATE TREATMENT OF DEPRESSED FRACTURES OF THE  
SKULL IN THE NEW-BORN.\*

DISCUSSION.

DR. RALPH MUNSON BEACH reported the case of a primipara, aged twenty-one, who went into labor at full term October 12, at 5 o'clock P. M. Strong pains began at 8 P. M. and from midnight they occurred at two-minute intervals. There was full dilatation of the cervix and a spontaneous rupture of the membranes at 4.30 A. M. and her attending physician at 5.30 A. M., twelve and a half hours after the definite onset of labor, made one application of the forceps.

After five or six tractions he decided that the head would not come through the pelvis and then Dr. Beach was called in. The patient then had strong and frequent pains and the fetus was lying in the left-sided position. The heart was regular. The vaginal examination showed a flat pelvis with a very sharp protruding promontory. The actual measurements were not taken as he had no pelvimeter with him. The fetal head was pressed tightly against the inlet in the left occipito-transverse position, both fontanels being at the same level. The disproportion was evident so he made a single application of the forceps to satisfy the people. The tractions he made did not last over two minutes. This was at 6.30, when the woman was two hours in the second stage. There was, at this time, no depression palpable on the baby's head. The patient was removed to the Methodist Hospital and Dr. Beach performed a Cesarean section. This was at 9 A. M., four and a half hours after the onset of the second stage.

The operation was uneventful but the baby was born as-

\*For original article, see page 264.

phyxiated. It was resuscitated, however, in about fifteen minutes by means of aspiration of the trachea, the Schultz method, and the employment of oxygen. At birth the baby did not cry vigorously and showed a depression of the skull over the left frontal region extending from the top of the forehead to the coronal suture and from the median line to the temporal region. This depression was 4 centimeters in length, 5 centimeters wide and 1.5 centimeters deep at the deepest part. The baby weighed 9 pounds 4 ounces.

It was evident from the location of this depression that it had been caused by the promontory of the sacrum. There were two small forceps marks on the right frontal region.

About six hours after delivery there was first noted a jerking of the left hand and forearm and then of both forearms. There appeared a lateral nystagmus in both eyes and some twitching of the face and an inability to take the milk from the bottle. These symptoms continued, but after the fourth day, the baby began to take its formula better. On the tenth day it was decided to raise the depression and this was done with the use of the little elevator kindly loaned him by Dr. Kosmak. For twenty-four hours after the operation and elevation the baby showed some increase in the nystagmus and twitchings, but from that time on, there had been no symptoms; the baby's cry increased, the patient took the bottle well and had been gaining in weight and appeared like a normal baby in every particular.

DR. SIMON MARX had seen many cases of the kind reported by Dr. Kosmak and it seemed to him that those with the depressions got along without any trouble whatever; what Dr. Kosmak had stated had opened his eyes. The method he used was certainly a very ingenious one, but only from a theoretical standpoint.

DR. F. C. HOLDEN said it had been his privilege to see Dr. Kosmak treat depressed fracture of the skull in the new-born by means of the elevator and he was very much impressed with the simplicity of the operation. No anesthesia was required, there was no shock following the operation and there was apparently no chance for sepsis to occur. No cerebral irritation followed. It was in his opinion an instrument that was cleverly conceived and worthy of trial.

DR. SIDNEY D. JACOBSON congratulated Dr. Kosmak upon the results that he had obtained by the use of his instrument in cases of depressed fracture of the skull in the new-born and he reported a case in which operation was done under spinal anesthesia; in this instance the baby was born with paralysis of one side of the face when there was an extensive lesion on the opposite side of the brain caused by a depressed fracture. He had had good results with the use of spinal anesthesia during labor. He recently had occasion to look up the literature regarding depressed fractures of the skull and there was a splendid article by Harvey Cushing of Baltimore in Keen's Surgery on intracranial

hemorrhage in the new-born and in this article the statement was made that 40 per cent. recovered.

DR. DORMAN had seen one or two cases of depressed fracture in the new-born in which the depression was relieved after the use of only a little massage. However, it seemed to him, that the device offered by Dr. Kosmak was a very ingenious and practical thing. If there was a deep furrow the employment of the instrument was all right. Harvey Cushing's work in Keen's Surgery had reference to cerebral hemorrhage, and not to depressed fracture of the skull in the new-born.

DR. GEORGE W. KOSMAK in closing the discussion again called attention to the importance and advisability of treating these fractures of the skull in the new-born as soon as possible after their production. He referred to a case just seen in a boy six years of age who was brought to the Lying-in Hospital by his mother, who had subsequently been confined by the staff, and as the deformity in this child was then observed, she was asked to bring him to the institution in order to have an x-ray taken. This child showed a depression in the right frontal bone which was less marked than at the time of birth, but still sufficient to affect the facial contour. The mother stated that the child was apparently well, although not particularly bright in his school work, but there were no symptoms of epilepsy. Dr. Kosmak stated that he formerly believed that these lesions in many cases were mere depressions in the bone without an actual fracture being present, but from an experience based on closer and repeated examinations in a considerable number of cases, he had invariably found a distinct cleft in the bottom of the depression, through which an instrument could readily be entered. In view of the simplicity of the operative procedure advocated there seems to be no good reason why it should not be carried out in every instance.

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*Meeting of November 29, 1912.*

FRANKLIN A. DORMAN, M. D., *in the Chair.*

CYSTS OF THE CORPUS LUTEUM SIMULATING ECTOPIC GESTATION.

DR. FRANKLIN A. DORMAN reported this case which was of interest because there was with it a story of a mistaken diagnosis. The patient was twenty-four years of age, married, and was first seen on October 25. Her menstruation began at the age of fifteen and occurred every twenty-eight days. Her last menses occurred on August 28. She had one child with instrumental delivery four and a half years ago. Three years ago she had a miscarriage. Nine months ago she was operated upon for chronic appendicitis. At the same time she had a Gillian suspension, and button-hole suspension for prolapsed ovaries.

Six weeks ago she began to have pain in the left lower abdomen, variable but increasing, together with morning vomiting and this had continued during the past four weeks. She was admitted to the hospital on October 25 complaining of severe pain; she then had a temperature of 99.2, pulse 100 and respirations 24. The blood count showed leucocytes 18,500, polymorphonuclears 81 per cent., and lymphocytes 19 per cent. The examination revealed a mass which was very tender in the left fornix with fullness in the culdesac of Douglas. The uterus was held in place by the suspension operation, making the degree of enlargement of the uterus a difficult matter to determine. A tentative diagnosis of ectopic gestation was made and operation was done on the following day. There was found a mass on the left side which was presented to the Section. The specimen consisted of a Fallopian tube of rather small caliber and tortuous in outline and it was intimately attached to a ruptured cystic structure about the size of a walnut. This was apparently an ovary as it could be identified by the presence of a large corpus luteum. The microscopical diagnosis made was chronic salpingitis with a corpus luteum cyst of the ovary. The patient miscarried October 31. The cyst was thin walled and yellow in color. The point of especial interest was the severe pain in a cyst of the corpus luteum of pregnancy.

LARGE INTRALIGAMENTOUS HYALINE AND CYSTIC FIBROID  
WITH CYSTIC OVARIES.

DR. DORMAN presented this specimen which afforded quite a surgical problem, because of its position in the broad ligament. The surgical difficulty, however, was less than might have been because the tumor was shelled out beautifully. The patient made an uneventful recovery. She was forty-one years of age.

DEMONSTRATION OF THE PULMOTOR FOR THE TREATMENT OF  
ASPHYXIA NEONATORUM.\*

DR. J. CLIFTON EDGAR presented this instrument.

DISCUSSION.

Dr. Dorman said that usually one could get the lungs expanded in these cases of asphyxia neonatorum by manipulation but only by continued physical exertion to oneself and with bad reaction to the vitality of the child. What was presented was a very scientific way of approaching the matter of resuscitation. Every large maternity service should have the apparatus.

TUBERCULOSIS IN ITS RELATION TO PREGNANCY, LABOR, AND THE  
PUERPERIUM.

DR. RALPH WALDO LOBENSTINE said that there was still prevalent the superstition that pregnancy on the whole was not

\* For original article, see page 255.

harmful, that it might at times even be of benefit to the woman afflicted with a tuberculous lesion. Of the more progressive practitioners who admit that pregnancy is not desirable for tuberculous woman, how many realize the actual seriousness of this relationship? The fact was that the strain of child-bearing exhausted the vitality of the tuberculous subject and in a high percentage of cases brought about an untimely end.

The effect upon the pregnant woman of an active tubercular lesion admitted of two divisions: 1. Does parturition lay the foundation of tuberculosis? 2. Is an existing tuberculosis aggravated by parturition? In answer to the first question, Fishberg states that in 286 married tuberculous women under his care 107 or 37.4 per cent. claimed that they had noticed no pulmonary symptoms until after one or more childbirths. P. Jacob and Pannwitz found that in 337 cases of tuberculous women, 2 per cent. traced the origin or aggravation of the disease to pregnancy. Again Maragliano found that in 385 women, 226 or 59 per cent. believed the tuberculosis had started during parturition. Charles C. Trembley of Saranac says that a compilation of the histories of tuberculous women who had born children revealed an astonishing number of cases which attributed the onset of their symptoms to pregnancy and parturition. In his series of 240 cases, 151, or 63 per cent., gave a positive history of tuberculosis originating or at least first definitely recognizable after the birth of a child. These figures may be open to some error but still they showed that in many cases at least, pregnancy was directly responsible for the development of tuberculosis in the susceptible individual, or might cause dormant tubercular lesions to be rekindled.

In answer to the second question as to whether an existing tuberculosis is aggravated by pregnancy, it was difficult to obtain accurate data, but it could not be denied that those who had been close students of this question firmly believed in the baneful effects of pregnancy and the puerperium upon all types of active tuberculous processes. Lebert stated that 75 per cent. of tuberculosis cases were badly influenced by pregnancy and the puerperium: Deibel, 64 per cent.; V. Rosthorn, 70 per cent.; V. Bardeleben wrote that from the communications received from fourteen correspondents, 71 per cent. grew worse from parturition, and that 47 per cent. of the active cases proved fatal. In a series of his own published in 1908, 34 per cent. were mild cases, with slight cough and moderate temperature reaction. In all of these mild cases there was a slight aggravation of the symptoms in the course of pregnancy, but in most of these the aggravation subsided in from eight to twelve months after labor; of these 16 per cent. were chronic healed cases, showing no symptoms. In 12 per cent. the cases were severe in type and all showed a marked decline during the last trimester of pregnancy. There was decided loss of flesh and strength during the last two months



of pregnancy. In 38 per cent. of the cases the diseases was far advanced and all were undeniably seriously affected by parturition, nineteen cases dying (one in the eighth month, undelivered; two in labor; sixteen in the early weeks postpartum). Since 1908 he had personally met with forty additional cases. In this series, thirty were mild in character. All of these passed through pregnancy without serious features, yet in all there developed toward the end of pregnancy a moderate aggravation of the temperature curve, with or without cough. If there had been a gain in weight during the middle trimester, this was lost, either in the last month of pregnancy or in the first six weeks postpartum. This series included a number of private patients who were able to spend the greater part of their pregnancy in the country or mountains. To obtain accurate data the patients should be followed for at least three months after delivery. Repeated pregnancies were especially undesirable.

All observers seemed to agree that laryngeal tuberculosis complicated by pregnancy was a source of the gravest danger to both mother and child. This statement was confirmed by such men as Grosskopf, Rosthorn, Kuttner, Juracz, Freudenthal, Sokolowsky, Penkow and Hellendall. Kuttner claimed that 90 per cent. of the active cases were doomed thereby. Of 231 complicated cases, 200 died during labor or soon after. Abortions and premature labors were particularly liable to occur with laryngeal tuberculosis.

In regard to the tuberculin reaction during pregnancy, Wolff Eisner, Robert Stern, Bar and others had shown that a "lessened reaction to tuberculin tests was seen during pregnancy. This lessening of susceptibility progressed up to the time of labor, then gradually returned to a normal degree of reaction. Bar, Schorl, Schlimpert and others believed that the lessened susceptibility during the last trimester of pregnancy might be due to a developing tuberculosis of the placenta. This latter condition might not be as uncommon as had been generally supposed.

As to the effect of an active tuberculosis in the parent upon the offspring he thought it only reasonable to suppose that abortions took place more commonly than in nontubercular cases. This was partly due to the cough, partly to vomiting, or the temperature, or it might be due to an endometritis or a beginning tuberculosis of the placenta. The tendency to premature labor was even more marked than the tendency to abortion. This was seen particularly in tuberculosis of the larynx. When the disease was stationary or when the pulmonary condition was but moderately active it was possible for the tuberculous woman to bring forth an apparently well-nourished healthy child. This fact was seldom noted in the severe grades of tuberculosis. While apparently some children were born healthy, they were more frequently found to be poorly nourished and underdeveloped.



A majority of the children though apparently healthy, if kept under observation beyond the short obstetrical period showed a tendency to develop malnutrition or tuberculosis.

Congenital tuberculosis did occur but only in exceptional instances. Foreign observers were disposed to believe that a good many of the so-called postnatal infections were really cases of intrauterine infection. In the light of recent work on tuberculosis of the placenta, this possibility should be carefully weighed. Schmorl, Schlimpert, Norak, Ranzel and others considered it quite possible and probable that during hard uterine contractions tubercle bacilli were forced from the placenta into the fetal circulation. According to Weinberg, 67.9 per cent. of the infants of tuberculous parents, whose mothers died within one year after labor, died likewise within the first year of life. Other statistics showing the high death rate among these infants of tuberculous mothers were cited.

In regard to lactation, it was found that women with mild or passive pulmonary tuberculosis might at times nurse their children with impunity both as regards themselves and their offspring. This was surely not the rule. Nursing of an infant by a known tuberculous woman was a double menace and should never be allowed. Even in mild cases nature requires every chance in order to overcome the tuberculous lesion, and where the mother may seem to be in fairly satisfactory condition during the early part of the puerperium, her ultimate recovery was yet more likely to be retarded.

As for the child, there was no question but that it entered life heavily handicapped. The two essentials for its welfare were proper nourishment and wholesome environment. Here they met the problem of breast milk or artificial food.

Lobenstine believed that the majority of these children would thrive better on the milk of a wet nurse or on cow's milk properly prepared. If nursing be allowed it should only be carried out under strict supervision in all truly active cases, although the ideal method was the isolation of the child.

The medical and hygienic treatment resolved itself into practically the same general methods that were employed in nonpregnant tuberculous women, but the difficulties were far greater. These difficulties were that the patients were married, were pregnant, and on this latter account were refused admittance to the majority of sanatoria. What these patients needed was better supervision from the beginning of pregnancy, and watchful treatment for at least six months after the abortion or the birth of the child.

The obstetrical management divided itself into four operative procedures: 1. Artificial abortion; 2. artificial abortion followed immediately or at a later date by resection of the Fallopian tubes; 3. abdominal or vaginal hysterectomy after the removal of the fetus; 4. artificial abortion followed by excision

of the placental area per vaginam. Operative interference was indicated under the following conditions. (a) During the first three or four months of pregnancy an abortion should be performed, where possible, in all active cases, and the less delay there was the better. In cases with the tubercular tendency, but with no active lesion, this operation was not justifiable. It was not indicated in cases with healed lesions, providing the patients were in good general health. If the operation was performed early in pregnancy, under the strictest aseptic precautions and preferably after a preliminary twenty-four-hour tamponage with 5 per cent. iodoform gauze, it would disturb the patient but little and would in most instances forestall the more serious changes incident to uninterrupted pregnancy. After recovery, the hygienic treatment should be resumed with energy. While the therapeutic abortion was so often indicated, the induction of premature labor was not. A consultation was necessary before undertaking any one of the operations under discussion. The operation of salpingectomy was now being widely urged in all active early mild cases in which the uterus was emptied. It was in these mild cases that they found the greatest hope from radical interference and yet it was in this very type that the greatest laxity existed among both profession and laity in the event of pregnancy. In pulmonary tuberculosis of greater severity, seen during the first three or four months, an abortion should be performed, but the operation might prove of more value if followed by abdominal or vaginal hysterectomy. Veit, from a study of 347 collected active cases in which abortion was performed, had shown that 43.3 per cent. were not helped by it; while Bardeleben claimed that 50 per cent. of his active progressing cases died after artificial abortion. Where the disease was active and progressive in character abortion had been followed in some cases by acute miliary tuberculosis. On the other hand, Trembley, of Saranac, showed that of twenty-nine cases of therapeutic abortion only one case showed some recrudescence. In those cases found to be failing rapidly, whether during the middle trimester or late in pregnancy, no operation would prove of much value.

The results of abortion are so unsatisfactory in the severe cases because of tuberculosis of the placenta. It is now believed that tuberculosis of the decidua and placenta is far more common than had hitherto been admitted. Schmorl, Geipel, and Wertheim asserted that it was found in 45 per cent. of tubercular women on the average. Upon separation of the placenta, the intervillous spaces, the favorite resting place of the bacilli were then traumatized and the bacilli were cast into the adjacent structures or into the system at large. Thus in severe cases a vicious circle was established. In such instances the radical operation should be resorted to in order to eliminate the uterine portion of the vicious circle.

Vaginal excision of the placental site was an entirely new procedure and did not appeal to many despite the excellent results obtained by its originator, v. Bardeleben. Abdominal hysterectomy was the operation of choice. V. Bardeleben claimed that both his operation and abdominal hysterectomy had a striking effect upon tuberculosis. Discussing the question of tuberculosis with relation to marriage and procreation, Dr. Lobenstine declared that tubercular cases should be advised not to marry until the process was fully arrested. The time limit was placed at from one to three years after the pulmonary lesion was healed. If, despite warnings, tuberculous individuals did marry, they must be warned against the dangers of conception; precautionary measures should be adopted just as long as a lesion was active in either husband or wife. Conception meant, in active cases, early death of the mother in a large percentage of cases, or a child with hereditary predisposition, or the necessity of more or less constant exposure to postnatal infection. Knopf believed in vasectomy for all tuberculous male patients and salpingectomy for all tuberculous female patients, married or not, who would submit to the operation. He would make this obligatory in all acutely active cases that insisted on marriage, despite strong medical advice. This attitude was now shared by many clinicians who had studied the problem carefully and had broken away from the narrow-minded ways of the past. What applied to tuberculosis alone applied with greater force to tuberculosis and syphilis or tuberculosis and alcoholism.

#### DISCUSSION.

Dr. J. CLIFTON EDGAR said that it would be three years ago, some time in February, that a very important paper was read before the Section on Obstetrics and Gynecology by Dr. Charles C. Trembley of Saranac Lake and it was the consensus of opinion that night that the therapeutic operation would be the issue of the future, not only in the frank cases of tuberculosis but in the latent and so-called cured forms of tuberculosis. Another viewpoint had been presented by Dr. Lobenstine, the performance of a hysterectomy or an operation upon the placental site. This was a new idea and one in which he was extremely interested because of the statement made by Dr. Trembley three years ago regarding the cases of active tuberculosis.

Few could understand the attitude assumed by Pinard of Paris that certain cases of tuberculosis were improved by pregnancy. During the first few months it appeared that these women were bettered; but as Dr. Lobenstine had stated, after the fifth or sixth month these women seemed to fade away. There seemed to be a general idea that tuberculosis actually favored and bettered pregnancy. It should be borne in mind that the existence of pregnancy itself does not always cause much increase in the tuberculous symptoms at first. The best atti-

tude to assume was that of the alarmist from the very beginning. Dr. Edgar could not see how pregnancy could better in any way any type of tuberculosis, whether it was latent, cured or moderately active. The question before them was a difficult one when one considered the people in moderate circumstances and without proper surroundings. When one had been in practice for twenty years he must see a great many children born of tuberculous mothers and so often he found babies healthy, but who had not the resistance to disease as other children.

Dr. Edgar referred back to a discussion that occurred three years ago in which the therapeutic abortion was the question at issue; it was at present the question and he believed that it would be the question of the future. In cases of incipient tuberculosis in patients in the beginning of pregnancy, or patients with so-called cured tuberculosis, with no tubercle bacilli in the sputum and with no physical signs of the disease, or those even with a small spot, the consideration of the case came down to the question of environment and circumstances.

In summing up the treatment from his standpoint, in patients with a tendency toward the disease, he believed that it was a dangerous procedure to empty the uterus in every case. One should be extremely cautious in advising the emptying of the uterus when there was only this tendency toward tuberculosis. Proper environment and a consideration of the circumstances of the patient should be more carefully considered.

During November four patients had been referred to Bellevue Hospital with the opinion that the uterus should be at once emptied. One was a very active case and he was asked to empty the uterus at once, but Dr. Edgar thought it best to wait a week, in order to better the patient's physical condition. This patient had a temperature, a pulse of 130 and was about three weeks from her time for delivery. He believed that in these cases the labor should be made as easy as possible, especially in the cases of active tuberculosis. Let them alone during the first stage of labor but the second stage should be made as short as possible; anesthesia should then be used and instruments applied.

With regard to the care of the patient during the puerperium and the nursing, he agreed with what had been said. It should be borne in mind that in many of these cases it was better to cut off pregnancy by two weeks; this gave an easier labor, produced less shock and less strain upon the woman.

DR. HERMAN J. BOLDT said that the induction of an abortion on the indication, "a tendency to pulmonary tuberculosis," cannot, in his opinion, be considered other than malpractice, if he understands correctly the definition "tendency to." One could say of any person who looks thin and is of slender physique, in whose family some one was afflicted with tuberculosis, that that person, who is now appearing somewhat below par, has a tendency to tuberculosis. And if the person be a pregnant woman whose desire is not to have offspring, induce an abortion.

The induction of an abortion is indicated only when a woman has incipient phthisis, or phthisis not far advanced, in an active state, and if it is shown that under the influence of pregnancy the pulmonary condition is aggravated.

For one's own sake, as well as for the patient's sake, it is advisable to have this certified to, not only by the family physician, but also by some one who has made tuberculosis of the lungs more or less a particular study to enable him to give an intelligent opinion, one based upon experience from the observation of such patients.

Sterilization is justifiable in all such patients. If done, the technic should be such as will really assure the prevention of conception. The tying of the Fallopian tubes is inadequate; but if the interstitial parts of the tubes are excised and the uterine wound closed with a continuous suture, the patient retains menstrual function and she is absolutely sterilized. Moreover, the operation is readily done by the vaginal route. To do what is so extensively advocated by some, particularly our German confrères—vaginal hysterectomy—is not, in his opinion, indicated.

The induction of an abortion or of premature labor is, in his opinion, contraindicated in all cases when the pregnancy has progressed further than the first half of the period of gestation, when the pulmonary lesion is so far advanced that a marked improvement of the patient, a quiescence of the disease, cannot be hoped for.

All patients who have had, or who may have active pulmonary tuberculosis, accompanied by pregnancy, should be kept under most careful observation, and, should the first sign of an aggravation of the disease or renewed activity of the latent trouble manifest itself, the patient should be advised to have the uterus emptied at the earliest possible moment.

Questions of religion should not enter into consideration when human life is involved. And, to his personal knowledge, in one strictly sectarian hospital in Germany, only the medical side is considered.

DR. S. A. KNOPF said he wished to thank the Section on Obstetrics of the Academy of Medicine for having invited him to take part in the discussion of a very important subject. Heretofore, he had assumed the attitude of noninterference in early and very moderately advanced tuberculous cases of pregnancy; but he was willing to confess that he was more and more inclined to the emptying of the uterus in all cases where a positive unhealed tuberculous condition existed.

Considering what he had learned from the very interesting paper of the evening, he felt that he did not stand alone in this seemingly radical attitude. Besides the authorities quoted by the reader of the paper, there are Schottelius and Schauta who state in a recent very instructive article on "Abortus artificialis und Tubensterilisation wegen Lungentuberkulose" (*Beiträge zur*



*Klinik der Tuberkulose*, Bd. xx, Heft 2) that they have come to the conclusion that in view of the uncertainty of the prognosis in a tuberculous pregnancy the emptying of the uterus is indicated in every case. Carefully gathered statistics show that in 75 per cent. of positive cases of tuberculosis the pathological process increased rapidly during pregnancy, and particularly after delivery, toward a fatal termination. When, after careful counsel with a competent, or better two competent consultants for internal diseases and an experienced obstetrician or gynecologist, the diagnosis of tuberculosis and pregnancy is certain, the careful and aseptic emptying of the uterus by an expert is virtually connected with no danger. Noninterference means a mortality of 75 per cent. of the mothers and the birth of a tuberculous or predisposed child. It goes without saying that in the majority of these cases the ligation of the Fallopian tubes at the same time or soon thereafter to avoid further pregnancies is indicated.

The reader of the paper stated that 200,000 people died annually from tuberculosis in the United States. This is true but it does not give a full idea of the severity of the problem because it does not include the morbidity of the disease. It has been statistically proven that there are eight times as many tuberculous individuals as are represented by the death rate. This would give us 1,600,000 tuberculous patients in the United States. If you now consider that the majority of the tuberculous patients are poor and may become a burden to the community, it certainly seems timely to stop a tuberculous procreation. Of course, prevention in this instance is vastly better than interference and he was willing to take the responsibility before the law and God for every time he had advised tuberculous parents not to procreate.

One more point regarding the precautions you should take before emptying the uterus because of a tuberculous pregnancy. It should never be done without the written and sworn-to consent of the husband and no abortus artificialis and subsequent sterilization should be resorted to unless the operation has been agreed upon by two competent internists and an obstetrician or gynecologist. The problem you have discussed here to-night is a vast and important one, and instead of the paper having been read before a relatively small group of expert obstetricians, he wished it might have been presented to as large an audience as possible of general practitioners.



## ITEM.

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### CLINICS, DEPARTMENT OF PUBLIC CHARITIES.

*Calendar for February, 1913.*

City Hospital.—Obstetrics, Dr. Dorman, Wednesdays, 2:30 P. M. Gynecology, Dr. Stearns, Thursdays, 2:00 P. M.

Metropolitan Hospital.—Obstetrics, Dr. Storer, Wednesday, 26, 2:30 P. M.

Randall's Island Hospital.—Orthopedics, Dr. Ogilvy, Tuesdays, 10:00 A. M.

Cumberland Street Hospital (Brooklyn).—Gynecology, Dr. Pierson, Wednesdays, 2:30 P. M.

Kings County Hospital.—Gynecology, Dr. McNamara, Thursdays, 1:30 P. M. Obstetrics, Dr. Cominskey, Tuesdays, 10:00 P. M.; Thursdays, 10:00 A. M.; Saturdays, 10:00 A. M.; Dr. Judd, Thursdays, 10:00 A. M. Orthopedics, Dr. Truslow, Wednesdays, 9:00 A. M.; Dr. Napier, Wednesdays, 2:00 P. M. Pediatrics, Dr. Parrish, Thursdays, 4:00 P. M.

Coney Island Hospital.—Gynecology, Drs. McEvitt and Mills, Thursdays, 10:30 A. M.; Drs. Mayne and Ranken, Thursdays, 10:30 A. M. Pediatrics, Drs. Beck and McQuillan, Wednesdays, 3:30 P. M.; Drs. Pendleton and Van Wart, Wednesdays, 3:30 P. M.

All registered physicians, visiting and resident, and medical students are cordially invited to attend these clinics.

Cards of admission, valid until October 1, 1913, may be obtained at the *Academy of Medicine*, 17 West 43rd Street, Manhattan, and at the *Medical Society of the County of Kings*, 1313 Bedford Avenue, Brooklyn, as well as from the secretaries of the several medical colleges.

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## BRIEF OF CURRENT LITERATURE.

### OBSTETRICS.

**Toxic Character of Blood in the Free Peritoneal Cavity.**—Bröse (*Berl. klin. Wchnschr.*, September 9, 1912) calls attention to the fact not yet generally accepted, that the blood which finds its way into the peritoneal cavity as the result of a ruptured ectopic pregnancy, or after operations, is of a toxic character. He believes that there are three dangers resulting from this condition; in the first place, the blood offers a favorable culture medium for any germs which may have accidentally entered

the cavity; secondly, that it is possible for intestinal bacteria to penetrate the wall of the gut and bring about a disintegration of the blood clot, and thirdly, the patient is subject to an intoxication from the aseptic disintegration products of the degenerating clot. In addition to the cases which he has already reported, three new ones are added, in which the symptom-complex included collapse, small and rapid pulse, air hunger and prostration. If a primary collapse does not come on, the most prominent symptom is the involvement of the entire intestinal tract, which usually appears on the third, but sometimes on the second day. This is characterized by excessive vomiting, and obstinate constipation. A further symptom is the rise of temperature and pulse rate. The writer is not prepared to account for the cases of ruptured tubal pregnancy in which evidences of toxic absorption do not occur, although he regards the free blood in the cavity as a foreign body which, being without any use or function, should be removed.

**The X-ray Diagnosis of Advanced Extrauterine Pregnancy.**—Zurhelle (*Zentralbl. f. Gynäk.*, September 27, 1912) reports a case of extrauterine pregnancy near term with a dead fetus, in which a diagnosis by x-ray was attempted. It has been claimed by other observers that the differential diagnosis of extrauterine pregnancy may be confirmed by the position of the fetus, which is asymmetrical as regards the midplane of the pelvis. In Zurhelle's case, however, the fetal shadow was present in this position and he suggests that a sound be carefully introduced into the uterus before the exposure is made, so that the relation of the uterine cavity to the shadow of the fetal skeleton may be established. If this is carefully done and a living intrauterine pregnancy excluded, no harm can result to the patient.

**The Effect of Fetal Death on Pregnancy Nephritis.**—Molinari (*Berl. klin. Wchnschr.*, September 9, 1912) presents a case which he considers in relation to the much disputed question regarding the production of eclampsia. The patient, a ii-para, in the seventh month of pregnancy, was admitted to the hospital with a severe nephritis and evidences of an impending eclampsia. During the first six days after admission while the fetus was alive, only a slight improvement in the nephritis resulted. On the seventh day the fetus died and the albumen rapidly subsided, while the urinary secretion increased in amount and the edema disappeared. Eighteen days after admission the completely macerated fetus was spontaneously delivered and no further urinary changes took place. Molinari believes that the prompt recession of the nephritic symptoms with the death of the fetus is not accidental, but must be regarded as closely related and can be explained by the metabolic relations between the mother and the fetus. He considers that the intoxication of the mother resulted from the presence of the living child, and that as soon as this died, the toxins being no longer manufactured, the mother's condition improved.

**Artificial Fecundation.**—Hirsch (*Berl. klin. Wchnschr.*, July 15, 1912) considers that efforts thus far made show the feasibility of artificial fertilization in suitable cases, and that its execution depends on a scientific basis, and represents an operative procedure with strictly defined indications. The author's experience is concerned with sixteen cases, of which six were successfully treated, although in one abortion resulted in the ninth week. The fact that a failure resulted in the first seven cases is attributed by the author to a faulty technic, because in the succeeding nine cases a positive result was secured in six. The procedure is that advocated by Rohleder in most respects. The spermatic fluid is drawn up from the rubber condom with a dry sterilized syringe which should be warmed to 38° C. It is very important not to overheat the apparatus as the spermatozoa are more sensitive to excessive heat than to cold. Only a few drops of the fluid are injected into the uterine cavity in order to avoid colic of the organ but the remainder of the material is injected in front of the cervix, a tampon inserted and the patient kept in bed for about a day. The patency of the cervical canal must always be previously determined and if stenosis is present a dilatation should be undertaken about a week previously. The retroflexion of the uterus must also be overcome and if the patient is anemic a previous injection treatment with sodium arsenite is indicated. The application is made directly before or immediately after a menstrual period, although the latter seems to be the more favorable time. If unsuccessful at the first attempt the procedure may be repeated, although the author advises giving it up after the third session. Hirsch believes that if 10 per cent. of all marriages are sterile and half of these cannot be successfully treated by the usual methods, that at least one-third will respond to the procedure which he advocates.

**Corpus Luteum and Uncontrollable Vomiting.**—J. L. Chirea (*Gynäk. Rundschau.*, No. 19, 1912) discusses the relations between the corpus luteum as a gland with an internal secretion and certain disturbance of pregnancy hyperemesis regarding which no definite conclusions have yet been formulated. The administration of tablets of lutein in cases of excessive vomiting has been employed by a number of investigators with varying results. It has been assumed that one of the functions of the corpus luteum included an antidotal action to the poison elaborated by the decidua villi. The author describes a case which was admitted to Tarnier's Clinic, two and one-half months pregnant with her third child. Excessive vomiting was present together with general jaundice, marked prostration, a dry skin and tongue, and a marked leukocytosis. Before the preparations for clearing out the uterus could be completed the patient died. A postmortem examination of the pelvic organs showed considerable enlargement of the right ovary together with a large corpus luteum which on section was shown to have undergone cystic degeneration. The left ovary was smaller, but likewise full of

small cysts. The uterus and placenta did not present any abnormalities. Further studies of the corpus luteum seemed to show that this structure had undergone marked atrophy, partly by the formation of cysts and partly by an excess of connective tissue. The writer believes that a careful examination in the fatal cases of hyperemesis should be made with reference to the condition of the corpus luteum.

**Extraperitoneal Cesarean Section.**—Küstner (*München. med. Wchnschr.*, Oct. 22, 1912) claims that as the most certain preventive against peritonitis is to avoid the entrance of germs into this cavity through an operative or other opening, therefore that form of Cesarean section is most efficient which obviates this possibility. Küstner is an adherent of the method which was first brought out by Frank and Sellheim and believes that it is very unfortunate that this procedure should have been confounded with the deep cervical Cesarean section, because in the latter procedure the entrance of germs into the peritoneal cavity cannot be avoided with certainty. The author's experience now includes seventy-two cases, among which the indications included contracted pelves with other complications in the presence of a living child. There were four deaths among the children, three of which were due to a deep asphyxia and the other died after an interval of three days of meningeal hemorrhages. In some of these cases the child had already been subjected to prolonged labor after efforts at instrumental extraction. Küstner believes that no degree of infection on the part of the mother is a contraindication to this operation. Injuries to the bladder occurred in six instances (8 per cent.) which may be compared to a percentage of from 10 to 17 following pubiotomy. He considers that this will be less often reported in the future as the technic of the operation is improved. A well-marked advantage which is attached to this procedure is the fact that a paralysis of the intestine is entirely excluded as all handling of the gut is avoided. It has been claimed that the wound in the connective tissues which results is subject to infection, but Küstner denies this, and even where separation occurred a good result followed. He is ready to admit that the operation is a difficult one and not to be compared in its execution with the ordinary Cesarean section. It can only be done under suitable conditions in a hospital, by those who are skilled in the method, but Küstner believes that this is fully compensated for by the results as regards the children. There were no fatalities among the mothers in his series of seventy-two cases, which could be traced directly to the operation. He reports one death in a very much deformed mother in whom this is attributed to the anesthetic. In view of the good results obtained from those who have thoroughly tested the procedure, Küstner believes that extraperitoneal Cesarean section will in the future occupy an important position in the treatment of labors in contracted pelves.

**The Treatment of Eclampsia by Stroganoff's Method.**—Holste (*Monatschr. f. Geburtsh. u. Gynäk.*, Nov., 1912) claims that the symptomatic treatment of eclampsia must be followed and that no ideal results with any other methods are yet known. This uncertainty is laid to a frequent change in therapeutic procedures, and therefore remedies have been abandoned or unfavorably criticized before their trial has been sufficiently complete. He considers that this applies particularly to the procedure advocated by Stroganoff, which he has followed in a series of fifteen personal cases with certain modifications. In severe cases of eclampsia where dilatation was not sufficiently complete, the introduction of a dilating bag was added to the narcotic treatment. In addition to this the patients were thoroughly protected from all external irritants, but no mention is made of any eliminative treatment. In two cases a venesection was done. Holste believes that some results will be obtained with the biological reactions applied during the prodromal stage, as certain relations undoubtedly exist between the serum of healthy pregnant women, or those convalescing from eclampsia, and individuals that present the early evidences of toxemia. Although the delivery of the patient seems to have a favorable influence on the disease process, the relation between eclampsia and labor is not the same as between a poison and its corresponding antidote. Therefore objection must be made to the claim proposed by Liepman and others, that vaginal Cesarean section is called for in certain cases just as the amputation of an affected limb is required. Holste believes that the essential point in the treatment of the condition is to expedite labor, but not to resort to rapid delivery such as the Cesarean section. The conservative treatment is therefore to be recommended, especially in general practice, until a better definition of the pathogenesis of the disease promises us more reliable results.

#### GYNECOLOGY AND ABDOMINAL SURGERY.

**Sarcomatous Degeneration of Uterine Fibroids.**—Kubinyi (*Arch. f. Gynäk.*, Bd. xcvi, H. 2) believes that sufficient observations have now been published to confirm the possibility of the sarcomatous degeneration of uterine myoma. Moreover the continued presence of a submucous or intramural fibroid in the body of the uterus has a tendency to the production of a carcinomatous degeneration of the mucous membrane. The sarcomatous degeneration as well as the association with carcinoma threatens a patient particularly during the menopause and in the years immediately following the same. It is a factor which must be taken into account and should always be considered where within a year after the menstruation stops a bloody discharge again appears. At the present time we have no way of judging the effect upon the organism of myomatous tumors which have been present for a long time, but experience shows



that many patients are comparatively free from symptoms. In such cases the system seems to have accustomed itself to the presence of the tumors and as malignant degeneration is rare, there is no reason for advocating an operation in every case of uterine fibroid before the menopause. In case a patient presenting a fibroid tumor before the menopause reaches the menopause or goes beyond this, a careful watch should be kept and if hemorrhage or discharge follows, an intrauterine exploration should be made and the tissue subjected to a microscopical analysis. Before undertaking x-ray treatment for these cases the possibility of malignancy must be carefully excluded. Where the uterine cavity has been dilated by the presence of a tumor and not every part can be reached by the finger or the curet, it would be wise to resort to a radical operation even where the microscopical diagnosis speaks for the benign character of the growth. In every myomectomy the tumor should be immediately examined by an assistant and if any suspicion of malignancy is present, a total extirpation should be done at once. Where the tumor is believed to be benign and the microscope later confirms its malignant character, the uterine stump should subsequently be removed by the vaginal route.

#### **Operative Procedures for the Treatment of Uterine Hemorrhage.**

—Mackenrodt (*Berl. klin. Wchnschr.*, September 9, 1912) discusses the treatment of such cases in younger women in whom x-ray treatment cannot be employed on account of its degenerative effect on the ovaries. As simple curetage with other conservative measures is often insufficient to produce a cure, Mackenrodt suggests the ablation of the fundus of the uterus by incising the latter after exposure by means of a colpotomy. In the cases in which he has employed this method good results were obtained, and he believes that it is adaptable in such cases where it is desired to retain the adnexa.

**The Frequency of Sarcomatous Changes in Myoma.**—Warnekros (*Arch. f. Gynäk.*, Bd. xcvii, H. 2) referring to the tendency to substitute the x-ray treatment for the operative removal of uterine myoma, comments on the later dangers of this procedure. The importance of sarcomatous changes has not been sufficiently recognized, as statistics thus far collected vary markedly. Thus Ohlshausen, in Veit's "*Handbuch*" reports only 1.2 per cent. of myosarcoma. Warnekros has collected the statistics from Bumm's clinic and among the last seventy-eight cases of fibroid tumors reported, sarcomatous degeneration was found in seven, or in almost 10 per cent. of the cases myosarcoma was present. If these cases had been subjected to x-ray treatment, the results would undoubtedly have been very serious. Bumm himself, out of 200 operative cases from his private practice, found sarcoma recurrences after radical operation in four instances. These statistics seem to show the need of a more radical attitude in the treatment of fibroid tumors, particularly after the menopause.



**Operative Treatment in Double Uterus and Vagina.**—Strasmann (*Berl. klin. Wchnschr.*, September 9, 1912) reports four cases of a double uterus which he united by excising the septum and adjoining portions, and then suturing the two halves of the uterus together. He considers this preferable to removing half of the organ or resorting to castration. He thinks that this operation is justifiable because the condition is due to an insufficient union between the two Müllerian ducts, so that a bicornate or completely divided uterus is not a double formation any more than a harelip or a cleft palate. The operation is indicated in those cases where the procreative functions are disturbed or a closure of a portion of this structure results, with retention of the menstrual excretions. In one of the four cases two viable children were born subsequent to the operation without any lacerations or disturbance of the organ.

**Vesicovaginal Fistula of Criminal Origin.**—P. Srfameni (*Ginecologia*, vii, 1911) under this title cites two cases of vesicovaginal fistula resulting from attacks on the genital organs with a knife, in one case by the husband for frigidity, and in the other by an attacking male for resistance to rape. Vesicovaginal fistula generally results from injuries connected with labor, and instrumental or operative delivery, and may occur in the course of gynecological operations. The cases reported are almost unique as to the causation of the lesion.

**Spontaneous Torsion of the Normal Tube and Ovary.**—Auvray (*Arch. mens. d'obst. et de gyn.*, July, 1912) considers the various ways in which twisting of the normal tube may occur. A case observed by him, in a girl of fourteen years of age, was mistaken from its symptoms and location for an appendicitis. It was only at the operation that a twisted tube and ovary, previously normal, were found to be the cause of the acute symptoms, including pain, vomiting, and fever. The tube was twisted twice on itself. Such a case is very rare. Torsion generally occurs in the normal tube during gestation, or in the sac of a hernia. This latter form occurs only in very young children, from three to five years of age. The diagnosis is generally strangulated hernia. Yet the accident does not occur as rapidly as in strangulated hernia, the symptoms coming on gradually. The diagnosis is very difficult. Aside from pregnancy this accident is very rare in the normal tube. It also occurs in girls eleven to fourteen years of age. The twisting is generally near the junction with the uterus, and the mass is found in Douglas' culdesac. Diagnosis has never been made in these cases. Torsion during gestation is rare. In one form of torsion no inflammatory fluid is found in the tube, but the latter is distended with blood, the weight of which will predispose it to twisting.

**Surgical Treatment of Gastrointestinal Stasis.**—R. C. Coffey (*Surg. Gyn. and Obst.*, 1912, xv, 365) presents a study of this subject, including a report of forty-one cases in which he per-

formed the "hammock" operation. He says that there is a direct relation between gastrointestinal stasis and abdominal ptosis. This relation is purely physical and mechanical. The large majority of cases of ptosis may be successfully treated by medical and dietary measures. Gastric or intestinal stasis not relieved by medical and dietary measures constitutes the only excuse for surgery in this class of cases. Given a case of right-sided ptosis with a moderately movable right kidney, painful cecum and appendix, not relieved by medical measures, the proper treatment is removal of the appendix and fixing the ascending colon through a right rectus incision, plus fattening. This will be sufficient to retain the kidney in position. If the right kidney is exceedingly movable, and the symptoms demand surgical relief, the appendix is removed and the colon and kidney both fixed through a posterior incision. A coexisting pericolic membrane may or may not be removed, according to the judgment of the operator at the time. An operation which fixes a floating kidney without fixing the colon at the same time is not a sound surgical procedure. A mobile cecum, with or without the membrane, in which the hepatic flexure remains fixed, is best treated by fixing the cecum and ascending colon to the parietal peritoneum. Mid-line ptosis of long standing not relieved by proper medical treatment, is successfully treated surgically by shortening the ligaments of the liver and stomach, suturing the omentum to the abdominal wall, and expanding the upper abdomen. Sigmoid ptosis, producing severe stasis, can only be treated successfully by short-circuiting or excising. General visceroptosis, the pathognomonic sign of which is a floating left kidney, is not a surgical condition. Such patients may be materially benefited and made very comfortable by wise medical treatment combined with Martin's gymnastic treatment, but they can never be made normal individuals. The only hope for successful surgical treatment of general ptosis must be in the line of a prophylactic or orthopedic operation, which may be made possible in the future by improved diagnostic technic which will enable the doctor to determine the cases of movable colon in the feeble child before the ptosis habit has been formed; in which case the defect may be remedied by fusing the ascending colon to the parietal peritoneum.

**Dysmenorrhea.**—According to G. R. Holden (*South. Med. Jour.* 1912, v, 692) dysmenorrhea may be divided into two great classes: dysmenorrhea associated with and apparently directly caused by some pathological condition of the pelvic organs, and dysmenorrhea apparently independent of local pelvic conditions and caused entirely or in great part by general or extragenital conditions. Pelvic inflammatory disease, backward displacements of the uterus, and myomata are responsible for 90 per cent. of dysmenorrhea caused directly by pathological pelvic conditions. Other conditions than the three just mentioned are comparatively

rare causes of dysmenorrhea. Dysmenorrhea of the second class is of many types. Some general symptoms are more or less common to all cases. Anemia, malnutrition, general poor development, and instability of the nervous system are frequent. Many deformities or so-called displacements are local expressions of general maldevelopment, *e.g.*, anteflexions and some retroflexions. Treatment of class one is treatment of the lesion at fault. It is not necessarily operative and varies according to the degree of the lesion and severity of the symptoms. Double ovariectomy is never justifiable on account of dysmenorrhea alone. Treatment of class two is in great part general and hygienic. Absolute rest at time of the periods is preferable to drugs and the results are frequently as good. Treatment by corpus luteum extract is of advantage in selected cases. Dilation and curetage offers good results in selected cases.

**Treatment of Carcinoma of the Breast.**—C. W. Strobell (*Amer. Jour. Surg.*, 1912, xxvi, 385) finds that of 1065 cases only 40 per cent. showed metastosis to the axillary lymph nodes. He believes that removal of these nodes is less important than the avoidance of traumatism in excising adjacent tissues. For this reason he favors the following treatment: Cocaine, 40 per cent. solution, is driven into the segregated area by phoresis, the anode of the galvanic current being at the breast while the cathode is connected with a large dispersing pad on the back. As high as 200 m.a. of current may be used varying with the susceptibility of the patient. The cuticle is then destroyed with caustic potash. Tissues outside of the condemned area are properly protected from accidental chemical contact by means of strips of cotton flannel saturated with flour paste. A mixture of zinc chloride with powdered sanguinaria plus water to the point of proper working consistency is applied and protected with dressings. In twenty-four to forty-eight hours a layer of devitalized tissue is aseptically removed and a fresh application is made, repeating the process each twenty-four hours until the entire breast, including such underlying tissue as might be harboring infection, has been removed. Nature is now allowed to complete the operation in her own way, *i.e.*, by phagocytosis, establishing its own line of offense and defense the while sealing all possible ports of entry against reinfection; and finally casting off the dead from the living, leaving a smooth granulating surface. Strict asepsis should be maintained throughout. Skin grafting after Ochsner is done under cocaine cataphoresis safely and painlessly, the patient herself contributing the grafts. This grafting properly timed and performed, the grafts all "take" and the new skin—in due time—becomes freely movable upon its new base.

**Metrorrhagias of the Menopause.**—Émile Forgue and Georges Massabiau (*Presse méd.*, Sept. 28, 1912) say that the metrorrhagias of the menopause coming on without apparent lesion of the uterus should be called essential metrorrhagia. These hemorrhages have been attributed to metritis, sclerosis, and lesions

of the uterine vessels or musculature. Other authors ascribe them to lesions of the uterine mucosa. All of these conditions may exist and still there be no hemorrhage. The author rejects all these suppositions and thinks that we must look to changes in the ovaries for the causation of these hemorrhages. It is the ovarian hormone which causes the normal hemorrhages of menstruation. The supposition that it is disturbance of the internal secretion of the ovary that is at fault is supported by the fact that such hemorrhages occur at the extremes of genital life, puberty and the menopause, also by the fact that ablation of the ovaries cures these hemorrhages. In most of these cases the ovaries are degenerated and cystic. In a microcystic ovary there is a hyperproduction of interstitial cells and an hypertrophy of the gland of internal secretion. This may be the result of a general failure of the equilibrium of the vascular glands throughout the economy which preside over the development and suppression of the menstrual function.

**Intracapsula Hematic Cysts of the Spleen Simulating Ovarian Cystomata.**—Attilio Gentili (*Ann. di ostet. et gin.*, Sept. 30, 1912) described cases of complete degeneration of the spleen resulting in formation of a large cyst, so placed that it seems to be an ovarian cyst. These cases occur in regions where malaria is so frequent that the patient remains in a chronic malarial condition for years, or for an entire lifetime. The author gives detailed histories of two cases. They occur only under special conditions in which a trauma affects a spleen already undergoing degenerative changes. There is a flow of blood into a softened spot after the trauma, and this blood forms a cyst. This change occurs in adult women, during the menstrual life, and may be assisted by the periodic congestion. The softened, hypertrophied, spleen must be fixed by adhesions in an abnormal position. Diagnosis will be made by the coincidence of malarial infection with a trauma, or a labor, with pain and prominence of the abdomen. These intracapsular pseudocysts are distinguished from true splenic cysts by the construction of the capsule, deprived of an epithelial lining. They grow by transudations from the vessels of the capsule and by their rupture. After the diagnosis is made splenectomy is obligatory.

**Tubal Sterilization.**—L. W. Littig (*Surg., Gyn. and Obst.*, 1912, xv, 514) says that animal experiments, the ligation or excision of pathological tubes, and the results of like operations on normal tubes prove conclusively that tubal ligation with or without excision is not an efficient measure to prevent conception. The only operation which gives a promise of success is excision of all or a part of the tube with a deep, wedge-shaped excision of the uterine cornu, including the pars uterina of the tube, the uterine defect to be closed with a musculo-muscular and a sero-serous row of sutures. The anterior abdominal approach is the easiest, the simplest, and the safest. Granting that the state has the right to sterilize its mental and moral delinquents,

tubal ligation as legalized in Iowa, considering its remote possibility of success, and its ever-present although vanishing danger, is an unjustifiable operation, entirely without promise as a mean of lessening the procreation of the unbalanced. In medical practice, tubal sterilization is but rarely justifiable, because it does violence to the most deeply rooted of all instincts, after that of self-preservation. Considering the almost fiendish pertinacity with which the female economy conserves the function of the Fallopian tubes, the efficiency of vasotomy or vasectomy may also be questioned.

**Dermoid Tumor of Both Fallopian Tubes.**—Only three cases of dermoid tumor of the Fallopian tube have been recorded heretofore. J. N. Stark (*Jour. Obst. and Gyn. Brit. Emp.*, 1912, xxii, 217) reports an apparently unique instance of dermoid tumor of both tubes.

**Lipoids of the Ovary, Corpus Luteum, and Testicle.**—Henri Iscovesco (*Presse mèd.*, Oct. 16, 1912) says that all living cells are formed of proteids, carbohydrates, and lipoids. Among the lipoids are neutral fats, phosphated lipoids, and nonphosphated lipoids. All the neutral fats are soluble in ether, petrol, acetone, chloroform, benzol, and boiling alcohol. Most of them are fatty liquids. These lipoids act like the internal secretions. The thyroid contains a whole series of lipoids. The author has studied one of the lipoids of the ovary soluble in oils, which he has injected into rabbits, and later tested therapeutically on man. Injected into rabbits it causes hypertrophy of the uterus and ovaries, accompanied by intense congestion, causing extravasations if very large doses are given. Injections of this lipid have great power in women over hemorrhages; also in amenorrhea, painful dysmenorrhea, hypoovaria, castration, and troubles of the menopause. It is a tonic in senility, and lessens feebleness of age. In the chlorosis of puberty it has an excellent effect. A similar lipid isolated from the testicles causes hypertrophy of the testicles in male animals. They become unsocial and fight each other muderously. It acts only on the male genital organs. If pushed too far it causes paraplegia which passes off after the congestion has ceased. In men who are hypochondriac, neurasthenic, complain of frigidity, and genital feebleness, and in old men it causes improvement in general strength, ability to work, and increase of sexual appetite, with diminution of arterial tension. The specific lipid of the corpus luteum increases postpuerperal involution, assists lactation, and lessens nausea and vomiting of pregnancy. There is an antagonism between the lipoids of the suprarenals and the corpus luteum. The author concludes that in every organ of the vertebrates there is a specific lipid, which when introduced into the animal organism has the property of exciting the function of that organ. Each is homo-stimulating and acts on the centers in the medulla which preside over that particular organ.

# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### STENOSIS OF THE PYLORUS IN INFANCY.<sup>1</sup>

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(With Eight Illustrations.)

PYLORIC stenosis is now recognized as a definite pathological entity consisting of a true hypertrophy of the musculature of the pylorus. It usually occurs in well-nourished infants and among those breast fed as well as those bottle fed.

An accurate description of this condition may be found as early as 1841. Lobker in 1898 was the first to operate successfully for hypertrophic stenosis of the pylorus in an infant. Since then numerous monographs have appeared on the subject with Koplik, Nicoll, Scudder, Still, Richter, Bevan, Bunts, Stiles, Cautley and others as the authors.

There has been considerable discussion as to the etiology of pyloric stenosis in infants. It is said to be due to faulty embryological development and may be associated with other congenital deformities, which would make it appear that the condition is congenital. Dent found stenosis of the pylorus in a seven months' fetus. Undoubtedly there are cases of true pyloric spasm without muscular hypertrophy. These cases often show an excess of acid in the stomach, while the cases of hypertrophy have only the normal amount of acid present.

Stenosis of the pylorus is due to a hyperplasia of the circular and to a lesser degree of the longitudinal muscular fibers of the pylorus, which produces a longitudinal folding and swelling of the mucosa, thus obstructing the lumen of the pylorus. It is possible that pyloric spasm may accompany some cases of hypertrophy of the muscularis of the pylorus.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



Cases of true hypertrophy involving the pylorus reveal a firm tumor, white in color, of cartilaginous consistency and about the size of a small olive. Microscopical examination shows this mass to consist principally of an hypertrophy of the circular muscular fibers of the pylorus. Cunningham, however, has found the longitudinal muscle hypertrophied as well. The mucosa is found swollen and thrown into longitudinal folds. The pyloric opening may admit only a small probe but its caliber is always found diminished. There is never evidence of an inflammatory process.

The stomach may be found dilated and with thickened walls, or the walls may be much thinner than normal, due to excessive dilatation of the stomach. The intestine is collapsed and empty. The upper half of the abdomen appears full with a depression of the lower half.

Within a few days to a few weeks after birth an infant normal in weight and appearance will vomit the ingested milk; relief then follows and sleep often ensues. Later the intervals between the attacks of vomiting become lessened until all fluid taken is rejected. The vomiting becomes projectile in character and may occur immediately after a feeding or be delayed a half hour or more. The amount vomited may be greater than the quantity taken at a feeding, owing to the retention of a part of a former feeding.

The stomach contents show a normal degree of acidity. There is progressive loss in weight. Obstinate constipation is a noteworthy symptom. The stools resemble meconium or they may show evidence of the digestion of milk, should the pyloric opening be narrowed but not completely obstructed.

Violent peristalsis of the stomach, the waves passing from the cardiac end of the stomach toward the pylorus, may be seen shortly after the ingestion of food or the waves may be elicited by tapping over the stomach with the finger. The urine is diminished in quantity.

A hard tumor may usually be felt at the site of the pylorus, but the liver may so cover the tumor that it cannot be palpated. The x-ray may aid us by showing no shadow at the site of the duodenum after the ingestion of a solution of the subcarbonate of bismuth and milk.

*Differential Diagnosis.*—The cases of pyloric spasm are less acute. Stools show the passage of food into the intestine followed by symptoms of obstruction and later food once more in

the intestine. There are intervals of improvement. Diarrhea may be noted. Symptoms usually begin later, from one to six months after birth. While with pyloric stenosis the onset is early, the wasting rapid, there is less pain, the cry is that of hunger, the tongue is more coated and the vomiting is projectile rather than regurgitant, there is no increase in acidity of the stomach contents, there is obstinate constipation, palpable tumor and definite stomach peristalsis. We may have difficulty in making a diagnosis between pyloric spasm and hypertrophic stenosis of the pylorus in certain border line cases.

I would advocate, in cases of pyloric spasm, after a fair trial of food regulation and resorting to other medical measures with no relief, opening the abdomen and relieving the spasm of the pylorus by making a small longitudinal incision through the peritoneal and muscular coats of the pylorus down to the mucosa and uniting the incision in a transverse direction.

The medical measures that may be adopted in cases of pyloric stenosis are attention to the character of the food, the time of feeding and the quantity at each feeding, stomach lavage, opium, poultices to epigastrium, saline and nutrient enemata.

Prolonged medical treatment increases our operative risk as we may lose valuable time. The chief cause of death may be attributed to delay in operating.

Dr. Max Einhorn reports two cases, one recovery and one death, where he employed a very ingenious method of dilating the pylorus. He stretches the pylorus by means of an inflatable dilating pyloric catheter.

There is considerable question as to the permanency of the cure obtained in well-marked cases of hypertrophic stenosis by attention to feeding and medical measures.

It is now conceded by most observers that surgery offers the best chance for life in infants with stenosis of the pylorus.

Several operations have been devised, namely, divulsion, pyloroplasty, and pyloroplasty with divulsion and gastroenterostomy. All admit that early operation is desirable.

Loreta's method of divulsion is described as follows: "Expose the pylorus, open the stomach near the pylorus and through this wound pass the finger, a bougie or forceps, into the pyloric opening and forcibly dilate it." Nicoll reports seven cases operated by this method, five cases cured, no relief in two. Still reports nine cases operated by divulsion with but one death.

Some of the objections to this procedure that may be mentioned

are that it may be impossible to pass the finger, a bougie or forceps into the pyloric canal, as the latter may be so small as only to admit a probe. The peritoneum and muscular fibers are ruptured and the mucous membrane is contused and lacerated. A case is reported by Nicoll where the forceps passed through the pyloric canal and penetrated the duodenum causing a fatal result.

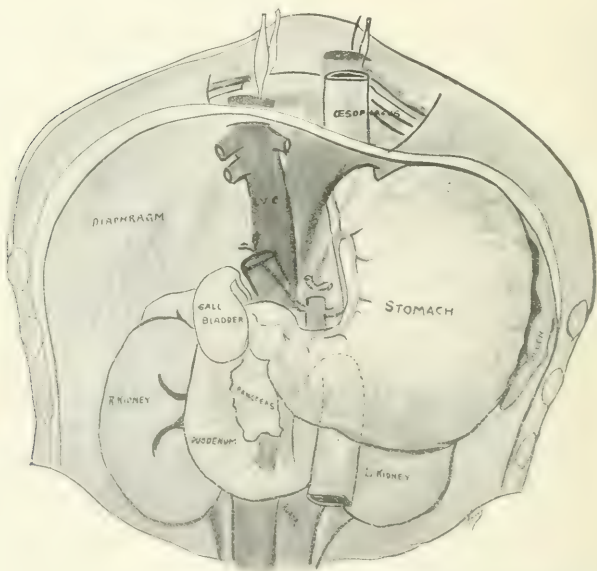


FIG. 1.—Liver removed to show relations of stomach, gall-bladder and duodenum.

Nicoll describes his method of pyloroplasty with divulsion as follows: "Expose the pyloric region. Apply rubber-covered clamps to the stomach and duodenum. Open the stomach and through this opening pass a closed artery clamp into the pyloric lumen. Dilate the pylorus by using the forceps as a glove stretcher. Make a V incision through the wall of the pylorus down to the mucosa, convert the V into a Y and suture. Close the puncture in the stomach."

Another method is described by Nicoll: "Omit the incision into the stomach. Make an incision through the whole wall, mucosa included, of the pylorus. Through this incision pass the artery forceps and divulse. Convert the V into a Y by sutures." There

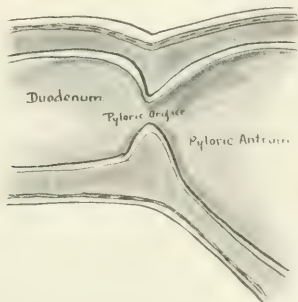


FIG. 2.—Semi-diagrammatic vertical section of junction of stomach and duodenum showing disposition of coats.

must be undue laceration of the mucosa and muscle by this method with great danger of infection of the wound.

Gastrojejunostomy, both the anterior and posterior methods, have been employed for the cure of pyloric stenosis. The no-

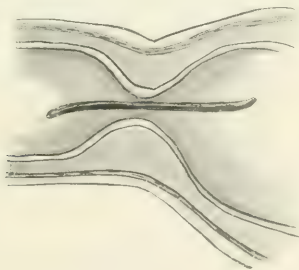


FIG. 3.

loop gastrojejunostomy is the choice of the greater number of surgeons who have operated for this condition.

This operation is much more readily performed upon the adult than upon an emaciated infant with a collapsed small intestine

of small caliber. Intestinal clamps may crush the thin walls of the jejunum and cause subsequent sloughing. However, the operation may be completed without the use of the clamps. Very fine needles and silk should be used on account of the exceedingly thin walls of the jejunum.

Gastrojejunostomy upon a weak, starving infant as a subject is a decidedly serious operation. It does not directly remedy the stenosis. Bile and pancreatic juice may enter the stomach through the stoma and thus interfere with the digestive processes.

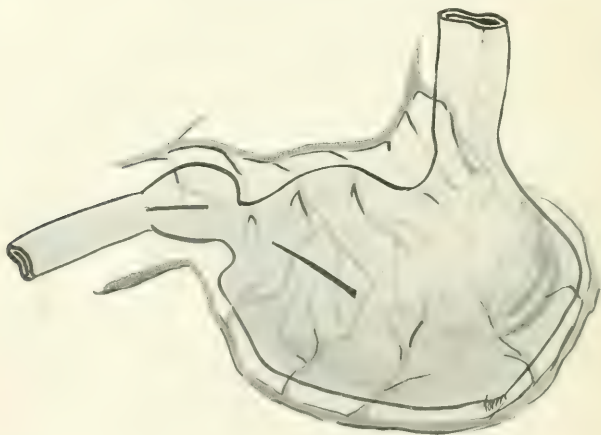


FIG. 4.--Lines of incision.

Wohlbach, six and one-half months after a gastrojejunostomy had been performed for pyloric stenosis in an infant, made an autopsy and says that "the pyloric tumor persisted and appeared as at the time of the operation."

Richter reports eleven cases of gastrojejunostomy for the cure of pyloric stenosis. Two were cases of pyloric spasm. One patient died on the fifth day following operation from a volvulus. Another died seven and one-half months after operation from intestinal obstruction from a kink caused by adhesions.

Cannon and Blake in 1905 stated that "it was important that food be mixed with the secretions poured into the duodenum,

that these juices are highly effective in digestion and also neutralize the acid chyme."

Jejunal ulcers may follow gastrojejunostomy and these ulcers may be due to the presence of acids in a region where inorganic acid is not normally found. Moynihan mentioned having known sixty cases of jejunal ulcer.

The physiological relations between the stomach, pylorus and duodenum are disturbed by a gastrojejunostomy. The high mortality following gastrojejunostomy for pyloric stenosis in



FIG. 5.—Showing opening into stomach through all three coats and pyloric opening down to mucosa.

infants varies with the period at which the operation is done, the skill of the surgeon, the resistance and general condition of the patient. These are all important facts to be considered when selecting the operation best suited to the case.

Scudder reports a 7 per cent. mortality. Among Bunt's personal cases four recovered, three died. In Bunt's collection of cases, fifty-three recovered, sixty-one died. Nicoll states that the mortality is about 50 per cent. Fridet and Guilmot report two cases of recovery by making a straight longitudinal incision of the pylorus down to the mucosa. The lips of the incision are then drawn apart and sutured together to form a transverse line. Weber also reports two similar cases. This operation



they call partial pylorotomy and of thirty-eight cases collected the mortality was only 26.31 per cent.

The temperature of the room before, during and after operation is important. It should be maintained between 85 and 90° F. There should be as little exposure of the patient to draughts and cold as is possible. Before operation lavage of the stomach and preparation of the operation field. Warm clothing and heaters should be placed about the patient during the operation.

The last case that I here report was operated upon in the following manner. A vertical incision was made through the right rectus muscle into the abdominal cavity which exposed the

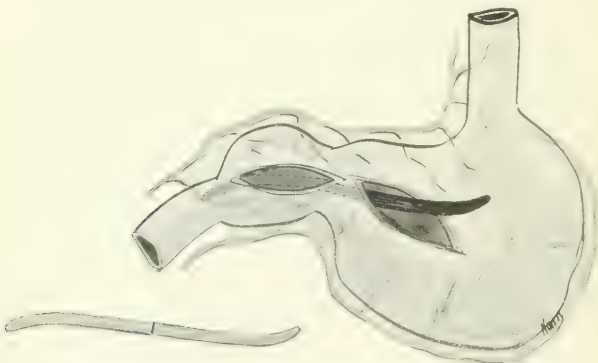


FIG. 6.—Hank's dilator in stomach opening and dilating pyloric constriction, incision at constriction allowing mucosa to unfold and relieve external tension.

pyloric tumor. We did not find it necessary to apply clamps to the stomach or duodenum. An opening  $\frac{1}{2}$  inch long was made in the stomach about 1 inch from the pylorus. A small-sized steel Hanks' sound, about the size No. 14 French was passed through the stomach wound and pyloric opening. The sound was left in position and with a knife the peritoneum and circular muscular fibers forming the pyloric tumor were incised parallel with the long axis of the pylorus, down to but not including the mucosa. The hypertrophied muscle was now separated from the mucosa laterally over half the circumference of the pylorus and a small portion of the muscle on either side removed, which allowed accurate transverse approximation of the wound. This procedure allowed the subsequent

easy passage, in turn, of the different sized smooth steel sounds until the pyloric opening was sufficiently patulous. The longitudinal folds of mucous membrane of the pylorus were unfolded without injury to the mucosa.

One will be surprised to find how readily the sounds, increasing in size, can be passed after the hypertrophied muscle which resembles soft gristle, has been incised and separated from the mucosa.

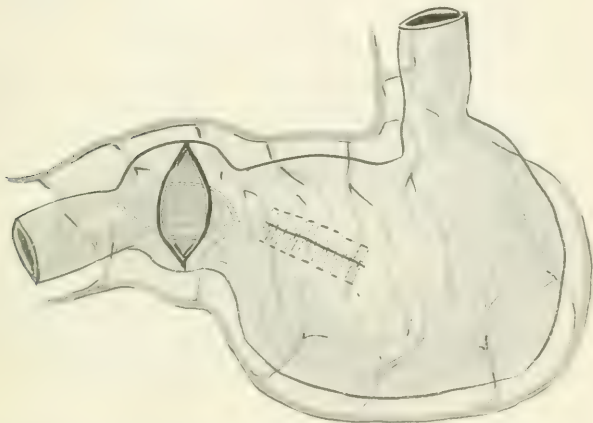


FIG. 7.—Removal of part of external and middle coats over pylorus allowing incision to be closed vertically, thus smoothing out longitudinal folds in mucosa.

The longitudinal incision through the peritoneum and muscle of the pylorus was closed with interrupted and Lembert sutures, so that the line of union was at a right angle to the long axis of the pylorus. This results in making the pylorus wider at this point than it was previous to the operation. The abdominal wound and the wound in the stomach were closed with two rows of sutures.

It is generally accepted that we should conform as closely as possible to physiological and anatomical conditions and whenever we are able to do so we should attack a disease at its source.

I believe that partial pylorotomy, or pyloroplasty alone, or either aided by gradual dilatation with sounds passed through an opening in the stomach and the pylorus after the hypertrophied muscle has been incised, separated from the mucosa

and a portion equal to about one-half the circumference of the pylorus removed, should be the operation of choice.

The results have been shown to be excellent and the parts are restored to a practically normal condition.

I wish to again call your attention to the desirability of incising the circular musculature of the pylorus for pyloric spasm which does not respond readily to treatment.

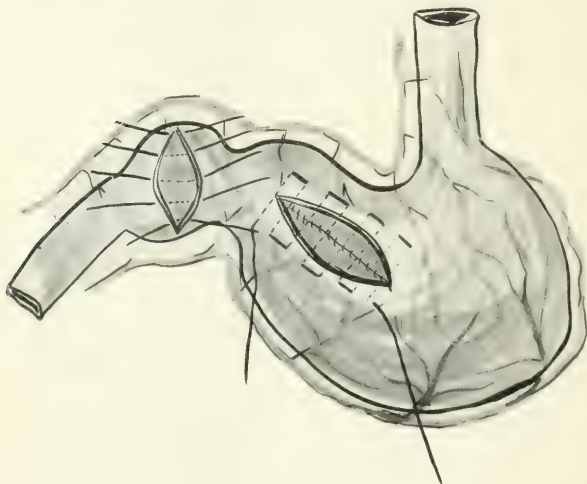


FIG. 8.—Closure of incisions.

B. J. T., a male infant was born May 31, 1905. He appeared to be a strong, perfectly well-developed child, weighing 8 1/4 pounds. By June 11 he weighed 8 1/2 pounds but from that time he commenced to lose weight rapidly.

He vomited the mother's milk from the first, usually the milk from one breast more than the other, but the fact that one breast furnished more milk than its fellow and in consequence of the infant receiving a larger feeding from the breast when the milk came freely, may account for this condition.

June 19, he was given modified milk and later barley water, koumis, etc. June 21 Dr. John W. Mitchell, the attending physician, called Dr. Edward T. Walker in consultation and the next day the patient was also seen by Dr. Charles Putnam of Boston, who said that the patient was either suffering from improper food or a stenosis of the pylorus. A wet nurse was then employed but the vomiting continued.

The vomiting occurred shortly after the ingestion of food and was projectile in character, the food being shot out of the mouth. The vomitus consisted of milk and mucus, no bile found.

I was called to see the infant by Dr. Mitchell, June 24, 1905; he was then three and one-half weeks old and weighed 6 pounds and 12 ounces. He has vomited all of the various foods given him from birth. Sometimes he vomited immediately after taking food and at other times the food might remain in the stomach for one-half hour. He was fretful most of the time but after emptying the stomach he seemed relieved and would go to sleep. Upon waking he was greedy for food. Contrary to the rule, his bowels moved freely and lately the stools were greenish in color with very offensive odor. He was very much emaciated, his ribs being very prominent due to the lack of nutrition. There was visible peristalsis of the stomach; the peristaltic waves passed from the cardiac end of the stomach toward the pylorus. No tumor could be felt by palpation.

Operation: A median incision 2 inches long, beginning just below the ensiform cartilage, was made, which revealed a nonadherent, hard, pyloric tumor, about the consistency of gristle, measuring 3 cm. in length by 1 cm. in diameter. The stomach wall was hypertrophied and the intestine collapsed.

An incision was made 1 inch from the pyloric end of the stomach and through this opening a steel sound, No. 14 French scale, was passed into the pyloric opening. The peritoneum over the pyloric tumor was split and a longitudinal incision was then made, with a knife, through the muscle down to the mucosa. Other sounds were then passed through the stomach wound and the pylorus into the duodenum. The largest size used was No. 25, French scale. The ends of the wound of the pylorus were brought together with Pagenstecher thread and the peritoneum and muscles were so united that the line of suture was transverse, which increased the diameter of the pylorus. The opening in the stomach was closed with two rows of interrupted Lembert sutures and the abdominal wall closed in layers.

Saline enemas were given and rectal feeding commenced shortly after operation. Within an hour he suffered severely from shock and was given minute doses of strychnia. He was given the wet nurse's milk with the aid of a medicine dropper.

June 29 the stitch in the skin was removed and on July 3 a small intramural abscess was opened, which healed in a short time.

July 15 he weighed 7 pounds and 5 ounces, although he continued to vomit considerably. He was again seen by Dr. Putnam with Dr. Mitchell and the former advised gastrojejunostomy unless he improved.

July 20 another wet nurse, a negress, nineteen years old, was employed. Her milk agreed perfectly with our patient and the vomiting ceased. Six days later the weight was 8 pounds and

3 ounces. Some weeks later in August, 1 pound a week was gained. Weight October 30 was 17 pounds and 5 ounces. Weight December 30 was 19 pounds and 14 1/2 ounces. During the latter part of December two teeth appeared.

January 28, 1906, the weight was 19 pounds and 1 ounce. Two weeks ago it was thought advisable to wean the child as the wet nurse's babe was about eleven months old (one year old March 6, 1906) and the quantity of milk diminishing. Modified milk was given, consisting of cow's milk, sugar of milk and lime water. This was immediately rejected while the wet nurse's milk was retained even when from 3 to 9 ounces were taken at a feeding, showing that it was the quality of the food and not the narrowing of the pylorus that caused the vomiting and the diminution in weight. The fact that the infant is teething may have some bearing in the case.

September 12, 1912. The infant continued to do well and is now a strong and rugged boy over seven years of age.

I. J. M., third., Dr. Wilson's patient, born September 2, 1911. Weight 9 1/2 pounds. Healthy looking infant. He was fed at the breast for three weeks when he commenced to vomit. The vomiting spells became more frequent and at the end of a week nothing was retained.

Consultation with Dr. Jordan, diagnosis incomplete pyloric stenosis. Treatment recommended. Vomiting ceased for twelve hours then returned and continued for three days. Case transferred to Dr. Jordan.

The baby, with regulation of food, was fed 2 ounces every two hours and did not vomit for one week. Then the pyloric opening closed completely. Projectile vomiting. Loss of weight. Constipation. Careful examination revealed a small tumor about 1 inch to the right of the median line midway between the umbilicus and the costal margin. Visible peristalsis was very plain.

I saw the case with Dr. Jordan and operated at the Saint Joseph's Hospital, October 8, 1911. The infant was five weeks and two days old. Weight 6 pounds and 10 ounces. Pyloroplasty with passage of dilators into the pylorus through an opening made in the stomach. Excision of a portion of the hypertrophied muscle of the pylorus.

Good recovery from ether anesthesia. No shock. Twelve hours afterward was fed in 1/2 ounce amounts. He was fed artificially on cow's milk modified. He made a complete recovery, going home from the hospital in one week. His weight increased on an average of 1/2 pound each week.

December 14, 1911, he weighed 10 pounds and 12 ounces. He has had no digestive disturbance since. He weighed, January 13, 1912, 13 pounds.

September 12, 1912. The infant has steadily improved and is to-day strong and healthy.

## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON PEDIATRICS.

*Meeting of November 14, 1912.*

WILLIAM SHANNON, M. D., *in the Chair.*

#### RELATION TO AND INFLUENCE UPON RESPIRATION DURING CHILDHOOD OF NORMAL AND ABNORMAL DENTAL ARCHES.

DR. ARTHUR ZENTLER, Consulting Orthodontist to the National Association for the Study and Education of Exceptional Children, read this paper. The question as to whether adenoid growths were the cause or the result of constricted dental arches had been much debated but not successfully solved. It was, however, known that proper breathing was interfered with wherever adenoids were present and that almost always this condition was associated with constricted dental arches; hence the latter must be looked upon as a hindrance to proper breathing. A normally developed set of dental arches preincluded a normally developed mandible and maxilla. Investigations had shown that a normally developed mandible and maxilla would be found only where teeth were existent and were in proper occlusion and that where occlusion existed, there normally developed dental arches would be found, notwithstanding the proportion of the width of the arch to the size of the teeth. The size of the teeth was not generally in harmonious proportion with the stature of the individual, nor with the shape and size of the head. A comparative study of anthropology and zoology would soon show that in all types of animals and in the different species of these types long oval heads had narrow dental arches and round heads had wide dental arches regardless of the size and shape of the teeth. It was therefore not necessary that a dental arch be of a certain width calculated from more or less arbitrary rules in order that it might be considered as normally developed as long as there was proper occlusion. In proportion as the occlusion was more or less perfect the dental arches would be more or less well developed and the more nearly normally developed the dental arches were the less would the nasal septum deviate and the larger would be the nares and as a consequence the nasal breathing would be better. Straightening of the nasal septum and a proportionate enlargement of the nares might be obtained by either a rapid or a slow process of widening the dental arch. Many factors were to be considered in deciding which of the two methods should be selected in the individual case. Whether the



widening desired and obtained was the result of space produced between the two maxillary halves in opening the maxillary suture, or whether it was the result of an expansion of such portions of the palatal bone which were less resistant, between other teeth was not definitely established, but it appeared pretty certain that the latter was the case. It was certain that no ill effects resulted from either process and at once obvious that the nasal respiratory passages must be improved as a result of this operation. Where adenoids were not removed at all or only after the sixth year, constricted dental arches were almost invariably found; on the other hand, wherever adenoids existed in infancy and were removed at an early age they might be sure to find relatively well-developed dental arches. Constricted dental arches might exist where there were no adenoids, and it could not be said that because this child had no adenoids it could breathe properly. The same factors which had caused the lack of development of the dental arches had also influenced the development of the muscles controlling the position of the upper lip. The upper lip would be found drawn upward and held there as through a contraction of the above-named muscles. It could only completely close the mouth through an unnatural forcing and expanding of the muscles controlling the position of the upper lip. The closing of the lips was therefore not a natural process and could not be done during sleep, except by applying special bandages. Through the keeping open of the mouth they not only got this position of the upper lip but through the pulling inward of the cheeks, as always happened when the mouth was open, the muscles of the cheeks acting as compressors of each individual half of the maxilla and mandible did not allow them to develop laterally, forcing them inward and forward. At the same time the keeping of the mouth open would change the normal position of the tongue when in repose, which when the mouth was closed rested flat against the palate or roof of the mouth and thereby necessarily contributed to a lateral development of the maxillary halves, while when the mouth was kept open the tongue dropped to the floor of the mouth assuming an elongated shape and contributed to the forward moving of the lower front teeth, augmenting the contracted shape of the lower arch already brought about by the force of the muscles of the cheeks and lower lip. The open mouth habit would not disappear after removing nasal obstructions after the deleterious work had been done. The "habit" would not be changed until the anatomical deformity was corrected. The efficient application of constant force by the use of adequate apparatus, which need not and did not hurt if properly constructed and adjusted, would spread the dental arches to their normal shape, until the teeth had come into proper occlusion, the lips closed normally and the child breathed normally through the nose. Dr. Zentler believed that barring general conditions which might be contraindicated, it was never too early to remove the adenoids and for the same reasons it was never too early

to proceed with the bringing of the dental arches into their normal shape. Early orthodontic interference was important not only from the prophylactic standpoint but because the earlier the teeth were brought into proper occlusion the easier and more permanently they would be kept so. The need of retaining the teeth in their new position was in direct proportion with the early age during which they were moved. If the early teeth were in faulty occlusion the permanent teeth would also be in the same faulty position. Because emphasis was laid on the importance of correcting faulty dental arches early it was not to be concluded that when the condition was found later it should not be remedied. An attempt to bring about proper occlusion should be undertaken at almost any reasonable age but the result would be only in proportion to the age when it was undertaken. Most of the abnormalities grew worse with the advance of age. The pediatricists were in the best position to sound the warning and that as soon as they noticed the "habitual open mouth" in the infant proper treatment should be instituted. Dr. Zentler called attention to the good influence of breast feeding in aiding the natural development of the maxilla and mandible. Later, the kind of nourishment that gave ample exercise, through need of thorough mastication, would add materially to the development not only of the bones supporting the teeth but also to all those bones immediately connected with them. The age of three or four years was none too early to anchor appliance on the teeth. Dr. Zentler presented cases and photographs illustrating the effects of improper occlusion and faulty dental arches.

THE SURGICAL ANATOMY; DIAGNOSIS AND TREATMENT OF THE  
INFLAMMATORY AFFECTIONS OF THE NASAL ACCESSORY  
SINUSES IN CHILDREN.

DR. SEYMOUR OPPENHEIMER presented this paper. He stated that sinusitis occurred much more frequently in children than was generally supposed, and that this applied not only to the older child but to the small child and the infant. For a careful study of the anatomical development of the sinuses, it seemed probable that many cases of meningitis were the result of unrecognized inflammation of some of the sinuses. In early life there was great variation in their size and shape; they were surrounded by much softer bone than at a later period of life; there was a more profuse development of the lymphatic and vascular systems and the mucosa was in most intimate relation with the osseous tissue, so that a slight inflammation of the former must produce some pathological change in the latter. In his experience chronic sinusitis was not as frequent in the child as in the adult, but acute and subacute sinusitis was common. Many instances of postnasal catarrh in children were but symptoms of some inflammatory condition of the adjacent sinuses. The maxillary sinus was well defined although rudimentary at birth,

and even inflammation of this sinus was not infrequent at an early age. This sinus underwent little change until second dentition, when the development of the second bicuspids and molars played an important part relation to the bones of the face. Most important in the child were the inflammatory affections of the ethmoid cells; these cells and the antra being more frequently involved than the frontal and sphenoid sinuses. In the child as in the adult, the middle turbinate body was essentially a portion of the ethmoid area, although its anterior end was thinned out, was small and ran parallel to the perpendicular plate, so that the lower border was deflected inward. At about the eighth or tenth year one found that the ethmoidal cells opened into the nasal meati and for surgical purposes, and especially in the recognition of morbid changes, the cells could be grouped into an anterior mass communicating with the middle meatus, while the posterior group opened into the superior meatus. The anterior group was by far the most important as its stomata were found along the semilunar hiatus and the fissure between the ethmoidal bulla and the inferior turbinate body at a location where infection from intranasal morbid changes most frequently took place. The anterior cells were more numerous than the posterior, although the latter were larger as regarded the capacity of the individual cells and their stomata were much less in size than those of the anterior mass. As the internal wall of the orbital fossa formed the external boundary of the ethmoid, the possibility of orbital symptoms as a complication of ethmoid infection was apparent and this relationship must be borne in mind on account of the extreme thinness of the ethmoidal-orbital wall. Previous to the seventh or eighth year the frontal sinus was not usually developed, though it might be present as early as the fifth year. At the eighteenth year its full development was accomplished. The anatomical and surgical relations differed in no way from that found in the adult except that its relation to the cranial cavity on account of the thin posterior wall was most intimate and this must be considered in relation to inflammatory processes. The sphenoidal sinus might show a definite cavity as early as the third year and was well developed by the seventh year. Its lateral walls were largely within the cranial cavity and especially was this to be considered in the relation to the development of obscure cases of basal meningitis, as was also its intimate relations laterally and superiorly with the internal carotid artery and cavernous sinus. The recognition of sinusitis in the child was more difficult than in the adult as the symptoms were more obscure and rarely characteristic. More than one sinus was usually affected at the same time. The frequency of the infectious diseases in childhood and the concomitant inflammatory changes of the nasal mucosa explained why the sinus should be involved during this period, and especially did this occur in influenza, scarlet fever, measles, and pneumonia. In the vast majority of cases there was a primary inflammation of the nasal

mucosa and the sinus became involved by direct extension. The swelling of the soft tissues around the sinus opening caused the secretions to be retained as a result of the stenosis thus produced. In the new-born, antral sinusitis might occur as a result of infection by the vaginal discharges from the mother, or as a result of instrumental delivery, and the resultant purulent inflammation involved the soft osseous antral walls. This was a true sinusitis and not a tubercular caries. As a rule, affections of the antrum occurred during second dentition. Infrequently errors in the development of the teeth might act as an exciting cause of the empyema. The ethmoid labyrinth in the older child was especially liable to become involved in all inflammatory affections of the nasal mucosa and in coryza and in the contagious diseases of children these cells were affected in practically every instance, and might account for suppurating ethmoiditis in later life, which had really existed from childhood. In the recognition of these conditions transillumination was practically valueless in children. The use of carefully made x-ray plates was of great service, especially as regarded pus in the antra or frontal sinuses and previous to the tenth year this was the most valuable diagnostic medium that they possessed. The presence of frequent headache should always occasion suspicion of sinus inflammation and occasionally tenderness to the touch, though this was difficult to determine in the young. In acute sinusitis, pain of an aching character was almost invariably present at some time during the course of the inflammation. In chronic cases it was very frequently absent unless secretions were retained under pressure. A marked symptom was the cessation of pain with the appearance of free nasal discharge. The presence of discharge, especially if unilateral and purulent or semipurulent in character, was always of diagnostic value, especially if intermittent. The location of the discharge was of great value in determining which sinus was affected, and this was determined as in the adult. Aprosopia and disturbance in the general health were more or less inevitable concomitants of chronic purulent sinusitis. In the so-called strumous child where there was a purulent nasal discharge with excoriated upper lip and marginal blepharitis, purulent sinusitis usually of the antrum and ethmoid cells existed, and while serious organic changes were not present when they did occur the ethmoid structures were most frequently involved. Serious orbital complications might ensue as a result of pathological changes in the correlated vascular sinuses. In the milder form a symptom uncommon and always of diagnostic value was edema of the eyelids from vascular pressure. If the confined pus was released promptly no serious results took place. In inflammatory processes of the maxillary antrum it was not uncommon to find involvement of the osseous structures of the superior maxilla. After cleansing the nasal chamber, the reappearance of pus in the middle meatus was indicative of antral suppuration, but in older children puncture of the

lateral nasal wall of the antrum was necessary to recognize the condition. On account of the complicated relation of the ethmoid system to the other sinuses and the fact that pathological changes occurred here most frequently it would be found that this sinus was the primary source of infection in the great majority of cases of pansinusitis. The recognition of frontal sinus involvement did not occur so often and was recognized as in the adult. The recognition of purulent sphenoidal sinusitis was by far the most difficult as it was practically always combined with ethmoidal changes and the symptoms were not characteristic. Severe occipital or vertical headache with more or less dizziness was suggestive of retained secretions in this sinus. The discharges were scant and usually inspissated in the nasopharynx, or along the posterior portion of the vomer and floor of the cloacæ and frequently the condition could not be recognized until exploration of the interior sinus had been made. This should not be done until the presence of other sinus affections of a purulent character had been eliminated. The treatment of sinusitis in the child should always aim to destroy as little tissue as is consistent with obtaining permanent results, and the intranasal mucosa should be preserved as far as possible. Palliative treatment would permanently cure the majority of acute sinus inflammations. Warm alkaline sprays and a weak solution of epinephrin solution should be used to reduce the congested mucosa, with, if the case was severe, rest in bed, the employment of a laxative and such general measures as might be indicated by the individual case. Hot vapor inhalations and the use of negative pressure to drain the sinuses had a distinct sphere of usefulness. Frequently the general health had been so impaired that local measures would not avail until proper care of the general health was instituted. When operative interference became imperative, it should be emphasized that the turbinal tissue should be preserved and while it might be necessary to remove the anterior end of the middle turbinate body yet the removal of its entire structure to reach the stomata of any sinuses was not warranted. The possible drainage should be obtained through the natural openings and to effect this it was proper to remove enough osseous tissue at such points as might be required. When the frontal sinus was involved, attention must be paid to the anterior group of ethmoid cells before the inflammation of the mucosa lining the frontal sinus would subside. When the antrum was diseased, inflammatory changes readily subsided, as a rule, under ordinary treatment. In obstinate cases after fracturing and pushing aside the inferior turbinate body, a large opening should be made through the inferior meatus into the sinus and the parts drained in this way. In certain fulminating forms of sinusitis in the child and in the persistent suppurative cases resisting endonasal treatment, with marked impairment of the general health or other violently acute symptoms an external operation was indicated. It should be emphasized that any

enlargement of the turbinate body was a serious obstacle to the cure of inflammatory changes in any sinus and until this was relieved, the sinusitis would prove most obstinate to treatment. Free drainage in this connection meant also free nasal respiration and must be taken into consideration in the surgical treatment of these cases. It was essential that when pus was found in any of these sinuses, it must be evacuated as a surgical principle and granulations and necrosed tissue must be removed. On this basis rested the treatment of all chronic sinus affections. The external operation on the frontal sinus in the young should be performed with the greatest reluctance in the absence of definite external or intracranial symptoms; when it was necessary to operate, the Jansen method should be used. In children the antrum rarely required external operation as opening through the lower nasal fossa with irrigation was usually sufficient to obtain a cure of the suppuration. Operative work upon the maxillary antrum must be performed with the greatest caution on account of the relation with the teeth at this age. In conclusion, Dr. Oppenheimer said it had been his experience that in young children radical operative procedures for the relief of purulent sinusitis were rarely indicated and were not as productive of satisfactory results as the more conservative intranasal procedures and while the same might be said of older children, yet when the sinuses approached the adult type, the same indications for treatment and the same operative procedures applied as in the adult.

#### DISCUSSION.

DR. JOHN MCCOY said that accessory sinus disease in children was more common than was generally supposed, occurring frequently but not diagnosed. In the etiology of the condition he laid great stress on adenoids. They are not only a focus of infection, but produce swelling of the tissues of the nose, and indirectly deviated septum, and these conditions in turn cause deficient drainage of the accessory sinuses. The adenoid itself also causes deficient drainage from the nose. So that when Dr. McCoy operates on a child of ten years or over for adenoids he does not assure the parents that the child will be a nose breather after the operation, but tells them that the child will probably have to have some of the hypertrophied turbinate tissue removed as well as to have its palatal arch corrected by a dentist.

The acute infectious diseases are a frequent cause of accessory sinus disease in children. In very young children the only symptom would probably be a mucopurulent nasal discharge. In older children this would be associated with pain. A careful examination would reveal the source of the discharge and an x-ray plate was of great value in determining the exact location of the sinusitis. In acute cases, 95 per cent. of them could be cured with rest in bed, attention to diet, laxatives and locally



adrenalin spray. In chronic cases the main question is one of drainage, and any obstruction to drainage from the frontal ethmoid or sphenoid region must be removed, first the adenoid, and then usually there is an hypertrophied middle turbinate or deviated septum. Occasionally an external radical operation must be resorted to. In conclusion Dr. McCoy reported two cases of sinusitis in children which resulted in brain abscess. One was cured and the other died. One patient one and a half years of age, who, following pneumonia, developed a double ethmoid suppuration which was treated by an eye specialist for six weeks, then was operated on by means of an external operation by Dr. McCoy. The dura over the frontal lobe was covered with granulation and about four weeks after operation the child developed brain abscess in the frontal lobe and died. The other was a boy ten years of age who developed acute frontal sinusitis with rupture in the orbit. This was operated upon by the external radical method, by an eye specialist. Later Dr. McCoy saw the case in consultation when the dura was found covered with granulations over the frontal lobe, later the child developed brain abscess in the frontal lobe which was opened and cured by Dr. McCoy.

DR. PERCY FRIDENBERG.—This subject is of great practical interest to the ophthalmic surgeon, who is confronted, not infrequently, with cases presenting ocular and orbital conditions which may be due in the last instance to suppuration in one or more accessory cavities. It is just as important, for diagnostic purposes, to exclude such involvement of the sinuses. The possibilities for ocular and orbital involvement are accentuated in infants and small children by the large size of the eye-socket as compared with the rest of the face, the consequent intimate spatial relations with the neighboring sinuses, and the extreme richness and complexity of vascular communications. Fortunately, there are factors of safety too in the sinuses of children, viz., their smallness and comparatively free drainage direct into an unobstructed nasal passage and the fact that there has not been sufficient time for chronic inflammation with resultant changes in mucosa, causing obstructive growths, or of bone disease. Etiologically, it seemed probable that some forms of intestinal infection, notably the forms due to colon bacillus, might be a cause of nasal suppuration, and this generally meant infection of one or more sinuses. The rôle of adenoids in these cases was not to be denied. The mere mechanical obstruction causing in turn turbinate swelling, venous engorgement in the pharynx, sphenomaxillary, and pterygoid regions was sufficient to bring about a decided disturbance of orbital circulation and produce exophthalmus or edema of lids. Thus in a case recently seen the symptom of intermittent protrusion of the globe coming on in the morning and growing less during the day in an infant, with some bloody pus discharge from one nostril had caused suspicion of accessory sinus suppuration. The latter was

excluded by careful examination and the scraping away of the obstructing adenoid mass and mild treatment directed to the nose cleared up all symptoms promptly. In several other cases, in older children, the pain of accessory sinus disease was simulated by syphilitic periostitis or osteomyelitis of the frontal, superior maxilla, or nasal bones. This specific disease as well as tuberculosis should always be borne in mind. In the case of strumous children, especially giving the picture described by the reader of the paper, the constitutional condition should be considered. The oculist not infrequently sees newly born children or young infants with edema of the lids, exophthalmus, or localized swelling about the orbit. All of these may be symptoms of accessory sinus disease but also they may be due to widely different causes. Gonococcus infection may travel up from the nose and infect the lachrymal sac and conjunctiva, and in all cases of blennorrhoea of the new-born the treatment of nasal involvement was of prime importance. Otherwise the course was slow and reinfections frequent. Many cases of dacryocystitis and of mucocele of the sac depend on obstruction in the nose, and this is not infrequently associated with infected sinuses. The traumatic factor in delivery had been referred to. In a child with protruding globe and evidence of hemorrhage into the orbit, we may have to consider whether forceps delivery was directly to blame or whether the proptosis is a sign of orbital complication of a sinus suppuration, itself of traumatic origin. Hemorrhage into the orbit producing protrusion of the globe may be due to a number of constitutional conditions. In the case of an infant, seen recently, one-sided extreme protrusion of the globe was a prominent, and for a time the only, symptom. After several days, the lids became discolored with blood pigment, and this condition of "black eye" showed that there had been a hemorrhage into the depths of the orbit. No history of injury could be elicited. A few days later the diagnosis was cleared up by the appearance of hemorrhages in the mucous membranes and at other points. It was a case of Barlow's disease, infantile scurvy, and got well promptly on appropriate diet. A localized swelling at the inner canthus may be due to disease of the tear sac or it may be a mucocele or empyema of the ethmoid cells. The former may have to be excluded by establishing the free drainage of tears into the nose, when any remaining swelling can be diagnosed. Sac swellings are usually below, mucocèles above, the inner palpebral or canthal ligament, but in very young children this is not easy to determine. Any swelling is suspicious of sinus complication which persists after removal of any concomitant tear passage affection. The cases cited by Dr. McCoy show that these conditions are met with by the oculists first. They are generally overlooked until some striking complication, ocular or orbital, calls attention to them. This explains why the pediatricist is inclined to minimize the frequency of these conditions. They are not taken to the

childrens' specialist. In special hospitals and eye and ear infirmaries, the conditions are not infrequently seen. Where there is evident pus collection in or about the globe it is not wise to make incisions through the lids. This could not be made stringent enough. Little if anything could be gained by stabbing at random. Orbital abscess was either a diffuse phlegmon where incisions through the soft tissues about the globe but not through the lids would relieve tension, or it was a pus accumulation starting as a subperiosteal abscess and breaking into the soft tissues. Here it was important to follow up the pus to its source. In most cases an incision curving along the eyebrow and exposing the inner upper angle of the orbit would lead to the origin of the pus. The incision should go through the periorbita and the latter be raised to expose the ethmoid region and inner end of the frontal. The prime requisite in operative work was free drainage and that generally meant removal of the ethmoid labyrinth and breaking through widely into the nasal cavities. If that were done we should not have relapses, protracted course of healing or intracranial complications. In very young children we should strive to preserve the orbital margin on account of its importance for growth and development of the eye socket which has such an important bearing on facial symmetry. The smaller the sinus the easier it is to remove all diseased tissue without sacrificing the orbital margin. Then, too, the pulley of the superior oblique which lies very near the margin in infancy would be less in danger. In the treatment of incipient, mild, or catarrhal cases of sinus involvement I have had excellent results with dry superheated air charged with vapor of iodine, menthol, coryfin, chloral and other medicaments. I use a fine Eustachian or frontal sinus catheter and get a local application which has marked action in drying up the inflamed and congested mucosa and in helping to reestablish drainage. Quinine and antipyrine internally as well as locally are of great value in shrinking up swollen membranes. The pain is often best controlled by external applications of moist heat. The rational early treatment will prevent complications and make extensive surgical procedures infrequent if not unnecessary. The greatest aid to this treatment is early diagnosis, and this again depends on careful, prompt and frequent examinations. Routine inspection of the nares in children should be as familiar and usual a step as the examination of the ears. If this were the case we should not be told that these affections are rare. The same thing was said years ago about otitis. A running ear was requisite for attention to be drawn to the ear. Later on, red and bulging drums were found in many cases. Nasal discharge is too often taken as a matter of course. It not infrequently means sinus involvement which often takes care of itself, it is true, but which should not be overlooked or ignored.

DR. ERNST DANZIGER said that the high palate and the deviation of the nasal septum was caused by nasal obstruction

not only in the form of a hypertrophic Luschka's tonsil but by a general hypertrophy of the lymphoid tissue of the pharynx and associated with the latter condition a hypertrophy of the mucous membrane of the lower turbinals. Acute accessory sinus disease had a tendency to recover spontaneously, but it was only in the more severe forms that a diagnosis was made. Edema of the eyelids and certain constitutional symptoms made the diagnosis comparatively easy. There were two great causes that made an acute sinus disease become chronic, first, interference with drainage, a septum with high deviation and constitutional predisposition, such as lues or tuberculosis. Second, if it was true that adenoids tended toward the formation of a high palate, and the high palate in turn tended to a deviation of the septum, then children with adenoids would be more exposed to the continuance of the acute sinus disease. If they considered for a moment that hypertrophy of the lymphoid structure in the pharynx represented a physiological attempt to protect the body against a systemic infection from the highly vulnerable mucous membranes of the upper air passages, they would readily see that children with a tuberculous or leucic taint gave all the factors for the production of such chronic infectious conditions. General hygienic, dietetic or specific treatment was as important as local remedies or mechanical prevention.

DR. EDWARD A. BOGUE said that he believed from the title of the papers that he was going to have a chance to find fault. But he had no fault to find. However, he wished to discuss the relation or the influence of respiration during childhood on the normality or abnormality of the dental arches. He had not changed his mind regarding what he had said in the past. But what had been presented in the papers should set them all to thinking.

With regard to vicious circles, much had been said regarding adenoids and little had been said regarding the age at which operation should be performed. Adenoids, if carefully looked for, were often noticed before the first year of life and they interfered mechanically with respiration of the child and the result was that the lungs had not a chance to develop fully and, as a result, the thorax did not develop fully. All this was coincident with the faulty dental arches. The vault of the mouth was not fully developed. Opening the mouth to breathe and with the tongue withdrawn from the roof of the mouth where it should remain caused the trouble. This occurred in cases of children afflicted with adenoids. The presence of the adenoids caused open mouths and air-borne diseases, by inhalations of infectious material into the lungs. A large proportion of mouth breathers were prone to have children diseases while others did not. It seemed to Dr. Bogue that it was within the province of the pediatricists to watch for adenoids; if they were not removed until the tenth year or later the mouth did not close and further

treatment was necessitated. The orthodontist then is the only resort, and at that age he does not always succeed in closing the mouth. If these patients have not passed six years of age the conditions were much better.

The mental development of the child was most rapid from birth to the age of six years; then there occurred a tremendous development of the brain and brain power. The physical and the mental development went on together up to that age, while from six to thirteen all growth, both of brain and body, seems to be intermitted for a time.

DR. GODFREY R. PISEK thought that it was very fortunate for them that they were able to hear from the other side. As so often happened the specialist reading a paper tended to unduly emphasize his point and now was the time to take a broad view. With regard to the frequency of sinusitis he believed that most of the children came to the general practitioner or pediatricist first when suffering from this condition. If one took the trouble to go over the dispensary reports, where the department was well organized and histories, etc., well taken, he would find that this diagnosis was *rarely* made. It was a very rare thing for them to see these cases of sinusitis and he believed that they were very uncommon. On the other hand, when they did meet with these cases the diagnosis was either easily and readily made or the condition was very much obscured. In the cases where the diagnosis was easily and readily made one would find edema, particularly about the orbit, which would call attention to the sinuses and then the patient very frequently was referred to the rhinologist. In the obscure types they were treated as possibly cases of typhoid or of incipient meningitis. These were the different cases. It was essential that they should make a differentiation by exclusion in these cases, watching with great care for any discharge that came particularly from one nasal orifice, and they should take note of any pain that began in the frontal sinus for often by such aids only could a diagnosis be reached. Dr. Pisek had only recently seen a case in which a diagnosis of typhoid fever had been made. Some of the symptoms were typical of this disease but a purulent discharge from one side was suspicious. The case was sent to a rhinologist who operated and confirmed the diagnosis. However the patient, in spite of operation, died of a secondary meningitis.

With regard to defective dental arches, Dr. Pisek thought that they should not harp too much on adenoids as a cause only of this condition because there were certainly other factors in its etiology. There was the nutritional influence, environment and certain vicious acts such as Dr. Kerley had called attention to and described such as the sucking of false nipples and pacifiers all causing some mechanical effect upon the formation of the arch.

A very important point was the care that should be taken of the *deciduous* teeth and he believed that not enough importance

had been attached to this not only by the physicians but by the dentists themselves. The latter were apt to scoff at the idea of caring for these teeth. If these primary teeth were decayed, it was right and proper that they should be filled even though they were not the permanent teeth. Dr. Pisek thought that the papers read should be helpful to them all.

DR. CHARLES GILMORE KERLEY said that he realized that these infections of the accessory sinuses occurred and results were produced such as Dr. Pisek had described; at the same time he felt that these cases were of comparatively infrequent occurrence. In a clinical experience covering a number of years he found that it was extremely rare to meet with such cases. He possibly saw two or three cases only a year. Possibly he overlooked some of these cases.

With regard to the frequency of the occurrence of these cases he asked how many were seen among children under the age of ten years in the course of a year.

With regard to the dental arches he was confident that the deformity or deformities occurred during the first eighteen months of life. Adenoids were found in a great majority of these children. There was also to be considered the use of pacifiers, thumb sucking and other things which tended to produce or establish a deformity of the vault of the pharynx, the classical cases that were so frequently met with of deformities. Where there was a marked elevation of the arch, there often followed a softening of the soft palate (?). This was accompanied by much destruction. What Dr. Kerley wished to especially emphasize was that the presence of adenoids caused certain deformities, especially of the dental arches.

Another factor he wished especially to bring emphasis on which had a bearing on the morbidity, the deformed dental arches, and this as well applied to the degeneracy that so many showed.

Dr. Kerley emphasized the importance of the question of nutrition in these cases. Children were more liable to develop these deformities of the dental arch when they were in a poorly nourished condition. When there was shown these deformities of the dental arches, after careful inquiry, it would be found that there was a history of inadequate feeding, and such was responsible for the process and the presence of the adenoids, of course, added to the continuance of the condition and the deformity of the dental arches. But to consider the presence of adenoids as the sole cause of the deformity Dr. Kerley believed to be a mistake. The facts in these cases had not, in his opinion, been clearly brought out. There were other factors besides the mechanical ones that should be taken into account.

DR. HENRY KOPLIK said that both the papers read were excellent ones, and what they had said about children with abnormal dental arches was an aid to the pediatricist and the specialist. These deformities of the dental arches were found



in children when they were *in utero*, and this congenital element was very often forgotten. There were also other etiological conditions that should be taken into consideration, such as rickets and other diseased condition of the bones. Mouth breathing was not a natural but an acquired habit; the baby cannot breathe through the mouth and obstruction of the nares gives rise to swallowing of the tongue because the infant cannot learn to breathe through the mouth.

With regard to adenoids, it was a question in his mind whether mouth breathing had anything to do with the formation of dental arch deformities. These abnormal conditions such as adenoids were rare at birth and only developed later on. Dr. Koplik did not believe that the mechanical element played such an important rôle as was ascribed to it. As to sinus disease, there was no doubt but that many of these cases were overlooked. Many of them he believed were discovered accidentally; this was a conclusion he came to for the reason that no attempt had been made to formulate the symptoms by means of which the condition could be discovered. Take, for instance, cases of diphtheria or scarlet fever, how many of these cases came to the physician with symptoms that pointed to acute sinus disease or antrum disease. At the Mount Sinai Hospital he remembered having seen two cases only in recent years. They both occurred in early infancy.

As he had always insisted the physician and the surgeon should cooperate in the care and diagnosis of these patients.

DR. FRANCIS JOSEPH QUINLAN did not believe that the last words regarding the subject under discussion had been uttered. He was inclined to think that the lymphatic tissues played a very important part in the etiology; in the majority of the cases met with it was no doubt but that the lymphoid tissues played a very important part and was quite a factor. Deviations of the nasal septum could be brought about by these lymphoid masses in that region. He said he had not been convinced that he had seen many of these cases of sinusitis. He once made a journey in which he made it a point to examine children who belonged to the so-called lower orders, examining them regarding their mental and physical conditions and he found that a large proportion had a discharge from the nostrils, were of an eczematous type, and apparently due to some diathesis, either tuberculous or syphilitic. He found but two cases of sinusitis. The verdict rendered was not at all conclusive was his opinion.

DR. FRANK E. MILLER said although he had been assistant to Professors John H. Ripley, L. Emmett Holt and John Dorning for a period of eleven years, ten years ago, he had never heard a discussion that compared in any way with that of to-night with regard to relation to and influence upon respiration of normal and abnormal dental arches, nor to the masterly arrangement of the important relationship of sinuses and accessory sinuses in childhood.

One thing that was not touched upon was the influence on and the relation to respiration of arches, normal and abnormal, also accessory sinuses, on the consideration of voice values. The abnormal dental arch alters voice values; *i.e.*, ask the child thus affected (from two years up) to say "a" as in dah, "o" as in dough, "e" as in dee, and at once observe the difference between this child and a normal one. The same children can be tried out with enlarged posterior turbinates in anterior nasal space or adenoids in the dome with "a" as in mah, "o" as in mow, "e" as in me, which will prove that there was an absolutely strong plea and sufficient reason for correcting those deformities for phonetic reasons. "A" as in ga, "o" as in go and "e" as in ge could be tried in these compared child voices, and right here the tonsillar question comes in, as well as their influence on the palatoglossi, palatopharyngei, and the muscular influence on the growing bony palate. All of these parts were certainly influenced by correction not alone for respiratory but phonetic reasons also.

For instance, see the effect of tracheotomy on the nasal and oral mucous membrane, and their lack of development from loss of voice vibrations upon them, especially the three turbinated bones; septum, dome, hard palate and teeth, epiglottis and thyroid cartilage of special value in the production of the seven limited overtones on the fundamental chordal tone in the reinforcing of vocal resonance.

Dr. Miller quoted the case of a child with monotone voice that was due to tonsillectomy under ether, where the surgeon, disconcerted by the effect of the ether given, and critical condition of the child, cut off the entire posterior pillar, which gave the child of five years a hollow, thick, low-pitched, monotone voice with anterior pillar hanging down over the ablated part, obscuring it for two weeks and creating difficulty in swallowing. Gradually the child recovered a fair speaking voice, but preferred to speak on one pitch. Such a child's voice would probably never be investigated further, as it never knew its loss.

In vocal art science, science's disclosure would probably be disastrous to the child's future peace of mind on the subject of phonetic values. Our course would be, not to "arouse the sleeping lion."

As a general observation it might be well to say that tonsillectomy, with a properly constructed Mackenzie, would never have allowed such a result, even with the great force applied for necessary expression to oblate the tonsil; besides its removal in the manner described would not injure the capsule or the supplementary pillars, so necessary to be considered in the conservation of phonetic values. Injuries to these muscles, palatopharyngei and palatoglossi, are most serious, as they impair and destroy palate and tongue action in song and speech construction as well as overtone; the tone governing articular or oral autonomy and the palate the resonant or nasal autonomy.

In adenoid removals if the postpharyngeal wall was injured

and dragged off it could be replaced and made to grow back, but should the superior constrictor muscle be injured, which was principally a swallowing muscle, the phonetic value of the upper register of the voice would be altered, as would injury to middle and inferior constrictors, if instrument slipped too far in a hasty and powerful removal, for the constrictors were the holding caliber supports for certain ranges of voice, called registers, the palatopharyngei being their regulators.

Dr. Miller also introduced Dr. Holmes Merton, who designed and made the charts at his suggestion. Dr. Merton then exhibited five charts showing:

1. The accurate location and geography of every vowel and consonant.

2. Every acoustic reinforcing resonator for seven overtones of the voice:

1. Thyroid resonator.
2. Epiglottic resonator.
3. Arch of palate resonator.
4. Dome of Pharynx resonator.
5. Inferior turbinated resonator.
6. Middle turbinated resonator.
7. Superior turbinated resonator.

3. Anastomosis of nerves supplying phonetic efforts, muscles, nerves, etc., for nose, tongue, mouth and throat with their plexuses and ganglia.

4. The entire vocal system based on units of voice construction, the units as autonomies, *e.g.*,

1. Nasal or resonant autonomy.
2. Oral or articulate autonomy.
3. Laryngeal or momentic autonomy.
4. Thoracic or wind-like autonomy.
5. Abdominal or semisolid supportive autonomy.

5. Autonomy of the unit of distribution of force in voice construction or analogous action and construction of the palatopharyngei from the superior constrictors to the uvula, and to that of the vocal chords themselves.

All of these points Dr. Miller declared were new and original, submitted for the benefit and discussion of the section of Pediatrics at the instance and special invitation of the Chairman of the Society, Dr. Shannon. Dr. Miller then thanked the Society for the invitation and attention.

DR. LINNAEUS E. LA FETRA said that he had never made a diagnosis of nasal accessory sinusitis in children and he was glad to have heard the paper calling attention to the condition. Undoubtedly many cases of persistent "colds" in the head were due to inflammation of some of the sinuses. Most of these cases he believed got well under conservative treatment.

With regard to adenoids they should be operated upon early if they produce any symptoms: he had removed them from infants as young as one week.

With regard to the development of the palate, high-arched palate often appeared in babies but a few weeks old; in such cases there must be a congenital or hereditary factor, since there was not time for the adenoids to produce such a condition.

DR. WILLIAM W. CARTER said that he was very much interested in what Dr. Miller said regarding the taking out of the tonsils and the effect upon the voice. Any extensive injury to the posterior pillars certainly injured the voice and it was his opinion that in many of these operations there occurred an injury to the posterior pillars.

Dr. Carter did not agree entirely with what was stated regarding what happened when the tonsil was removed with its capsule. He believes that when the enucleation is properly done that the pillars are not injured and that the voice is not impaired but is frequently improved by such an operation.

DR. PISEK.—He was much interested in the remarks of Dr. Miller and spoke of the work of Jellenek of Prague who advocated the carrying out of an examination of the voices of school children. If he found the singing voice was abnormal he carefully looked for the cause.

DR. SIDNEY VALENTINE HAAS believed that high and abnormal dental arches were not of themselves a result of adenoids in most cases. There are many other factors, chief among which are those pointed out by the reader of the paper. Especial stress should be laid on the statement, that high dental arches may be entirely normal, and are so when the "bite" is perfect.

DR. THOMAS S. SOUTHWORTH emphasized the importance of looking for these cases of accessory sinus disease; if these cases were not borne in mind, as well as many other conditions like otitis media and pyelitis, for instance, they would not be discovered. As a rule these cases of accessory sinus disease were pointed out to them by the rhinologist; he made the diagnosis of acute or subacute inflammation of these sinuses.

Dr. Southworth reported the case of a boy who had had for some years a persistent anemia and the anemia would not yield to all the sorts of treatment employed. It was evident that there was present a type of toxemia which resulted from the changes that were going on in the accessory sinuses and the child was now about to be operated on. In the subacute cases it was also probable that these patients were "germ carriers" and caused repeated outbreaks of infectious colds in their families.

DR. WALTER LESTER CARR said that these vicious circles referred to could not be helped and there was no doubt but that they to-day recognized more cases of sinus disease than they did formerly, and it was in his opinion, because they were now looking for these cases.

DR. HERMAN SCHWARZ said that in the clinic at Mount Sinai Hospital the question was asked if these children had their noses examined carefully and he had not yet obtained the figures which would enable him to make a satisfactory report.<sup>60</sup> He would

do this later. It was remarkable, however, the nasal deformities that were present without adenoids and although he believed that adenoids had much to do with these nasal deformities, it should be remembered that they could have these nasal deformities without the presence of adenoids. There were a number of cases operated upon which were not improved: when they looked at the condition of the nose they were often surprised that there were such deformities that existed among these children.

DR. ELI LONG was forcibly struck with the importance of making a routine examination of these children who presented themselves with accessory sinus disease.

DR. ARTHUR ZENTLER, closing the discussion, thanked the members of the Section for their attention and was very appreciative of the discussion produced.

He said: I thought to have very carefully guarded, in the writing of my paper, against conveying the impression that it was my belief that adenoids must be present in all cases where abnormal dental arches are found. In fact I have shown to-night the casts of a child's mouth where the dental arches were abnormal although adenoids were not present and presumably never existed, and the physician of the family, at present sitting among you, informs me that a similar condition of dental arches is present in the mother and other members of the family of this child. Who knows whether, after all, this is not another matter of eugenics. Who knows whether way back in the ancestry of this child the initial cause bringing about a narrowing of the dental arches was not the presence of adenoids, the narrow dental arches being transmitted through heredity, without the initial cause.

This in a way replies to the remarks made by Dr. Koplik, who said that the factor of heredity was often forgotten and not mentioned to-night, calling attention to the fact that other etiological factors, such as rickets and other conditions of the bones should be taken into consideration and that it must not be forgotten that dental arches are made *in utero*. With all this I am so much in accord, that a paper read before the Section on Stomatology of the A. M. A. was written by me with no other purpose in view except to show that the care of the mouth of the child must begin in the mouth of the mother during pregnancy. However if this was neglected and, because of one or other etiological factors, abnormal dental arches are present in children, we are confronted with the condition of faulty respiration, and to point out that this was the result of abnormal dental arches was the purpose of the paper, and not to enumerate the etiological factors in abnormal dental arches. Adenoids were mentioned as etiological factors rather in a doubtful way stating that it was not established whether adenoids created abnormal dental arches or *vice versa*, but they were mentioned for the purpose of disproving that they alone were responsible for lack of proper respiration, to the contrary claiming that abnormal dental arches are also responsible for this condition. Therefore coming back to Dr.



Koplik's contention that: "dental arches are made *in utero*," while this is true it must nevertheless not be forgotten that dental arches are not "finished" *in utero*, that their development goes on after intrauterine life up to the sixth year, and must we accept the condition handed down to us through heredity, as it comes from *utero*, if we can, during the developmental stage, help nature to correct it? This is what the actual purpose of the paper was to show wherein the orthodontist can be helpful, if the pediatricist directs these cases in time to him.

The point made by Dr. Pisek, saying that in allowing abnormal dental arches to occur, the dentist comes in for a large share, is a very good one. It is true that if the deciduous teeth are allowed to be extracted because of caries, or that when filled are not so filled as to restore contour and preserve proper occlusion, these conditions will act as etiological factors for lack of proper arch development.

Dr. Kerley's remark that the trouble began within the first eighteen months of life was correct, and therefore if adenoids were then present they should be removed, and this as early as possible, being that their presence creates mouth-breathing.

In concluding I wish to touch upon a point referred to in the discussion by Dr. Bogue and, namely, the influence of dental arches upon general physical development and mental development. Professor Boas, of the Department of Anthropology of Columbia University, in a paper read a fortnight ago before the Conference of the "National Association for the Study and Education of Exceptional Children," held at the City College of New York, related that recent investigations made by him show that the physical development at the age of four years in girls is about one and one-half years ahead of that of boys, and that this priority of physical development of girls over boys slowly advances, reaching the average of about two years difference in favor of the girls during puberty and up to adolescence. It was well known that mental development in girls is about two years ahead of boys but the establishing of the fact by Professor Boas that physical development is thus advanced in girls ahead of boys, necessarily will have to change our way of attempting to correct any abnormalities of the body, sex, beginning to be a factor, to be taken into consideration. On the other hand, in speaking of mental development, in this same paper, Professor Boas said that his investigations show, for instance at the age of ten, regardless of sex, half of a given number of people with their mental development ranging as between the ages of eight and ten while the other half ranging as between the ages of ten and twelve. This discrepancy increases with age, showing at the age of fifty, half of the people having a mental development as of between forty and fifty and the other half as of between fifty and sixty. Thus we see how careful we must be in speaking of physical development in its relation to mental development, keeping in mind that



as well as sex a certain average of mentality must be taken in consideration.

DR. SEYMOUR OPPENHEIMER referred to the splendid work which was done by the orthodontist and believed that other factors were frequently present which were responsible for a narrowing of the dental arch than adenoids. He felt that the orthodontist had frequently referred cases to the rhinologist, in advance of his beginning the mechanical part of the work, for an opinion and a possible correction of some nasal obstruction, which frequently was very slight in character and the correction of which had absolutely no influence on the dental arch, and while he did not want to deprecate the importance of proper nasal breathing in its relation to the development of the bony skull and facial expression, yet he felt the importance of the employment of nasal and nasopharyngeal surgery in many instances was unnecessary and inadvisable. He had often been astonished to note how a deflection of a nasal septum even of considerable degree was oftentimes overcome by the lateral spreading and widening of the maxillary arch. This was purely a mechanical proposition. The broadening of the arch allowed the septum to straighten itself as it elongated in the direction of the height of the nasal cavity. Frequently after the performance of the submucous resection of the nasal septum, the cartilage removed, while possibly markedly bowed while in position, straightened itself out after being removed, showing that the bending was often not a permanent one, but rather a septum bent by reason of great tension, which when relieved was immediately overcome.

As to the controversial subject of rapid or slow spreading of the dental arch, that was a question on which he could not speak with authority.

With regard to the frequency of nasal accessory sinus disease in children, that depended entirely on how alert they were in its recognition. Not long ago Dr. Kerley published a valuable contribution on 127 cases of acute otitis media occurring in private practice within one year in infants. If Dr. Kerley had directed the same enthusiasm toward the examination of the nasal chambers in these cases, he might have found almost as many cases of acute nasal accessory sinus inflammation among them.

The middle ear and mastoid process could be considered as one of the accessory sinus cavities, and it should be remembered that the mucous membrane lining the nasal accessory cavities, Eustachian tube, etc., was continuous with that lining. Why, therefore, should an inflammation of the nasal passageway during the course of a coryza or infectious disease, limit itself just to the nasal interior without extending into the accessory cavities lined by the extension of the mucosa. They saw a pharyngeal inflammation extend into the Eustachian tube and into the middle ear with great frequency. Why, therefore, should the nasal cavities show an immunity to infection?

The response to Dr. Kerley's inquiry as to how many cases he had seen during a year, he wished to answer by a counter question.

How many cases of diphtheria, measles, and other infectious diseases with nasal discharge did he see during the course of a year? For just as many of these cases as he sees Dr. Oppenheimer said he saw cases with accessory sinus disease. Many of the cases of recurrent coryza owed their origin to a focus within the accessory cavities, and probably many of the cases with their foul-smelling crust formations and purulent discharges and atrophic mucous membranes primarily originated as an infection of one or more of the nasal sinuses. It all came down to the question of what they were on the lookout for. One of the pediatricists here had told him that he never saw mastoiditis in infants. That was quite true until the otologist came into the wards of the hospitals. Within the past week, in examining a large number of children between the age of six and seven with the nasopharyngoscope, he found three children between the age of six and seven, in whom he could demonstrate discharge coming directly from the sphenoidal cavity. The only symptom evidenced was a postnasal discharge and that only objective. Among the radiographs I have passed about, you will notice three cases of very great development of the frontal sinuses with unilateral disease, all three of which were under the age of ten.

I do not wish to be construed that every slight nasal discharge means accessory sinus inflammation, but the careful routine examination of the nasal chambers in children will, I am satisfied, show a much larger proportion of subacute and latent infections than is generally considered.

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## TRANSACTIONS OF THE PHILADELPHIA PEDIATRIC SOCIETY.

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*Meeting of November 12, 1912.*

*The President, THEODORE LE BOUTILLIER, M. D., in the Chair.*

This was a joint meeting of the Philadelphia Pediatric Society with the New England Pediatric Society, the Section of Pediatrics of the New York Academy of Medicine and the New Jersey Pediatric Society. The meeting was held in Thomson Hall, College of Physicians, and was largely attended.

### THE TREATMENT OF HEMORRHAGIC DISEASE OF THE NEW-BORN.

DR. BETH VINCENT, Surgeon to the Infant's Hospital; Surgeon to Out-patients, Massachusetts General Hospital; Assistant in Surgery, Harvard Medical School, Boston, Mass., read this paper. He said that during past years but little progress had been made with the problems of the etiology and treatment of hemorrhagic disease of the new-born. They had still much to

learn about the cause of the disease but the recent use of serum therapy in this condition seemed to have marked a distinct advance in the treatment. This new treatment had been applied in the form of blood-transfusion and by the subcutaneous injection of animal serum, human serum and whole human blood. While the number of reported cases was not large, the results showed such a high percentage of recoveries as to justify the assumption that the use of the blood or its derivatives by these various methods was of therapeutic value in this disease.

*Review of Cases.*—In every one of the eleven cases treated by transfusion the immediate effect of the procedure was to check the bleeding and correct the anemia. The infants in the successful cases were apparently changed at once from sick to healthy children who slept and nursed in a normal manner. The only exception to this rule of easy convalescence was the case with extensive hemorrhages under the scalp. This infant did not do well until these hematomas had been absorbed. The cases of melena usually passed two tarry stools before fecal matter appeared in the movements. Eight of the eleven cases treated by transfusion were cured. One case died within twenty hours of a diffuse peritonitis which, as shown by autopsy, was undoubtedly present and undetected at the time of operation. One other case which ended fatally was probably of syphilitic origin. The bleeding was checked by the transfusion but the infant died of the syphilitic infection about one month after the operation. The most recent case of this series, although unsuccessful, furnished a good illustration of the possibilities of transfusion in hemorrhagic diseases. The patient, three days old, was brought to the Infants' Hospital on November 6, 1912, at 9 P. M. The cord had been bleeding for two days and the child reached the hospital in an exsanguinated and moribund condition. Death seemed to be a question of only a few minutes. Transfusion was done as quickly as possible with little regard for aseptic technic. The infant took an occasional shallow gasping breath during the operation which lasted about fifteen minutes. The pulse was improved by the transfusion but the new blood had no apparent effect upon the respirations. After immersion in a pail of hot water the breathing slowly improved and the infant's skin became red. The baby was very weak but slept during the night and took a little whey in the morning. At noon the child refused nourishment, the pulse and respirations gradually failed and death resulted twenty-four hours after the transfusion. The cases which recovered had been traced with one exception. The oldest child was now two years old and all were reported to be in perfect health with no abnormal tendency to bleed.

The four additional cases not treated by transfusion received injections of whole human blood. In two of these infants, which were apparently cases of true hemorrhagic disease of the new-born, the bleeding took the form of an intracranial hemor-

rhage which was indicated by a lumbar puncture and demonstrated at autopsy. The other two were cases of melena neonatorum. One infant died quickly of a continuous profuse hemorrhage; the other died suddenly of an unsuspected recurrence of the bleeding.

Although these four cases received injections of whole human blood, the fatal result which occurred in all of them cannot fairly be taken as evidence that this method was ineffectual, since three of the cases were moribund at the time of the injections and in the other case the injections were not repeated as prescribed in this form of treatment.

In view of the autopsy findings, transfusion, in all probability, would have averted the fatal result in the two infants with intracranial hemorrhage. It was a question whether, in addition to measures intended to check the bleeding, further operative procedures were advisable, in these cases, to remove the clot or to relieve the cerebral pressure. It was possible to state with certainty that transfusion could have saved the two cases of intestinal bleeding. In the light of past experience it was a matter of regret that transfusion was not done in one case by a mistake in judgment and that death occurred so quickly in another case where operation could not be performed.

*Summary.*—Several cases in this series received animal serum subcutaneously without apparent result, and were subsequently cured by transfusion. This agreed with the experience of other men in this respect, and without justifying the statement that animal serum was altogether ineffective, it confirmed their opinion that human blood or its derivatives was more valuable in these cases. As his experience in the treatment of hemorrhagic disease was almost wholly confined to transfusion, he was naturally prejudiced in favor of this procedure. The good results which had been obtained by Schloss and Commiskey and others who had used the human blood, and Welch in his large series of cases with blood serum was sufficient evidence that these measures were efficacious in checking the bleeding in this disease.

If, as seemed possible, the bleeding in many of these cases of hemorrhagic disease was due to a defect in the infant's blood which was apparently improved by all three methods of treatment, it would seem that transfusion was the ideal method because it restored directly to the infant's circulation all the elements needed for coagulation. In addition transfusion possessed the advantage of correcting the anemia by replacing the cellular elements which had been lost by hemorrhage. For this reason, as pointed out by the advocates of the other methods, blood transfusion was the only method from which results could be expected in the severe types of the disease in which the patients had been exsanguinated by continuous profuse bleeding.

The uniform success which had attended the use of the injection of whole human blood, blood serum and the transfusion of blood would lead them to believe that the best line of treatment

to pursue in these cases was a rational combination of all three methods. In those cases in which the bleeding was rapid and profuse and which were usually quickly fatal, an immediate transfusion was indicated. Since the disease, however, often began with trivial hemorrhages, in such a case, if seen early, the easier and more simple methods of blood or serum injections were in order. Assuming that these two measures gave equally good results, it would be advisable to make the first injection of whole blood to save delay and at the same time to collect enough blood to furnish serum for further treatment. This treatment should be continued if the bleeding stopped or seemed to be diminishing and the infant's condition remained good. Cases which did not follow so favorable a course or cases that were not seen until the patient was exsanguinated by hemorrhages which had been going on for some time were more safely treated by transfusion. The procedure was more formidable than simple injection but the results were immediate and permanent. Carried out by the method he described, the operation could be done with safety and without difficulty. Once accomplished, a case might be left with the assurance that the infant was in no immediate danger which was of no small advantage when the case could not be kept under constant observation.

Although it seemed possible to save most cases of hemorrhagic disease by these measures which stopped the bleeding, there were two forms of the disease with which transfusion or any other method could not always be expected to effect a cure. The first form included those cases in which the underlying cause of the bleeding, as bacterial infection, syphilis, and ulcers of the stomach or duodenum, was such as to be fatal in itself, and the second form comprised the cases with hemorrhage in the brain, adrenals, kidneys and liver in which the location and not the extent of the bleeding was the vital factor. With those exceptions their experience to date with the use of the human blood or its derivatives in hemorrhagic disease of the new-born seemed to show that this agent was capable of checking the bleeding in this condition and that, by the proper application of one or a combination of the methods under discussion, they could cure a large percentage of cases in this hitherto fatal disease.

#### PYLORIC OBSTRUCTION WITH A COMPARATIVE STUDY OF THE NORMAL STOMACH OF INFANTS.

DR. GODFREY ROGER PISEK, New York, said that it was not his object to take up in detail the various phases of this interesting condition, but to indicate how they might add, in an efficient manner, to the diagnostic resources already at hand. A review of the literature made it very evident that the condition was spoken of under varying titles in a very loose manner. This indefiniteness had arisen from the fact that there had not as yet been established a sharp line of demarcation among the various



types of pyloric obstruction. Various theories had been advanced which were supposed to account for its causation. One set of writers doubted that the condition was congenital at all since its manifestations rarely appeared before the third week. Others attempted to prove that it had its origin in fetal life and quoted the case of Dent who found a so-called pyloric tumor at autopsy in a seven months' fetus. Ibrihim and his followers took the ground that the cases were varying degrees of pyloric spasm, while another group of writers differentiated between cases having a true tumor and those of simple spasm. An analysis of the rather voluminous writings on this topic with its many theories forced one to the conclusion that after all little had been gained by these controversial theories and they did not tend to assist very materially in an elaboration of the diagnosis and did not tend to establish a definite form of treatment.

There were certain cases that exhibited the classical group of symptoms, projectile vomiting, steady wasting, constipation, excessive stomach peristalsis, in addition to a palpable nodular tumor in the pyloric region. These were the cases that must be regarded as true cases of pyloric stenosis. Cases had been reported without the presence of any palpable tumor but having all the usual symptoms in varying degrees of severity. It was perhaps in these that there was the greatest difficulty to determine the best method of procedure and in how far they might be surgical. The suggestion was given by the majority of writers that this group should be treated medically until the time when they resist medical management, as evidenced by a stationary or falling weight. They might then be subjected to laparotomy with a high degree of hazard. If a tumor was found the infant might be able to withstand a considerable degree of shock incident to the performance of a posterior gastrojejunostomy. If no tumor was found, little had been gained. Hutchinson in his Schorstein lecture was of the opinion that all cases should be treated medically first and he could find no satisfactory means of differentiating the surgical from the medical without preliminary treatment.

Notable achievements had recently been made in Roentgenology, especially with the use of bismuth in the alimentary tract. Modern apparatus, with the intensifying sheets, had enabled the radiologist to make instantaneous exposures, thus securing with the minimum effort negatives of value. With the assistance of Dr. L. T. LeWald this method was followed in the study of the normal stomachs of infants at various ages with and without known pathological conditions. They were fed bismuth milk mixtures, and exposures were made at short intervals with the baby in the *vertical* position. In this way only could one study the natural contour of this organ *in situ*, any anomalies of its size or position, or new growths. It was soon born upon them that their conception of the shape and activity of the infant stomach needed revision. The pictures shown by Dr. Pisek



gave some idea of the forms the infant stomach might assume and still apparently perform its functions.

Liquid foods began normally to be expelled in a very short time after they were taken into the stomach and this was very helpful in their diagnosis of conditions dealing with some forms of pyloric obstruction, for, if they could demonstrate with any degree of exactness by a series of radiographs, that the milk was retained for a greater length of time than in a normal stomach, as shown by the bismuth shadow, they could determine with what type of obstruction they were dealing. The findings in this study had been so illuminating that the prophecy might be made that in the future every suspected case of pyloric obstruction should be subjected to a radiographic study before a plan of treatment was determined upon just as to-day no surgeon would think of putting up a fracture without the use of the rays.

#### DISCUSSION.

DR. EDWIN E. GRAHAM of Philadelphia was especially interested in that portion of Dr. Pisek's paper that referred to the fact that a small portion of the stomach contents had passed into the duodenum within one or two minutes after the bismuth had been introduced into the stomach. He would like to know whether a sufficient number of cases had been examined to decide definitely as to whether this was an invariable rule. Is it possible that in any of these cases the amount of fluid that had been introduced in the stomach was rather excessive? Is it a rule that after a regular meal a portion of the contents of the stomach pass into the duodenum in one or two minutes? If this is a rule the portion so leaving the stomach could hardly be appreciably affected by any gastric secretion.

DR. FRITZ B. TALBOT was very much interested in Dr. Pisek's paper and anything that could help them in making a diagnosis of pyloric stenosis or pyloric spasm was very important. In some cases it was impossible to get these babies x-rayed and in these cases he was accustomed to give the baby subnitrate of bismuth by mouth. Subnitrate of bismuth was a crystallizable substance and if it passed through the intestinal canal could readily be observed microscopically in the stools. Absence of the typical bismuth crystals from the stools means that no food is passing through the pylorus.

DR. HARRY LOWENBURG of Philadelphia, reported one case of pyloric obstruction in which the bismuth shadow did not show beyond the spinal column. Charts showing the weight curves of two children were presented. In these cases both of partial pyloric obstruction which recovered. One child was eleven months of age now and weighed twenty-two pounds. There was also present a palpable tumor. The x-ray plate in which the shadow did not pass beyond the spinal column represented this case. A point that he considered important and

wished to bring before the society was the diagnostic and prognostic value of the administration of charcoal. If this substance passed through the prognosis was hopeful, whether there was present a hypertrophy or a spasm, or a mixed condition, it made no difference.

Another case was reported of a baby who was sent to Dr. Lowenburg as one of pyloric obstruction. The patient had persistent vomiting and obstinate constipation. It was probably a case of reflex vomiting. The case was carefully studied and the x-ray man said there was an unusually large twist in the sigmoid. This probably accounted for the constipation as well as the vomiting. The x-ray showed the bismuth meal to pass to the right of the spinal column within two minutes indicating no obstruction of the pylorus.

Dr. Lowenburg pointed out the dangers of the stomach tube and thought once that in its use in the above case the stomach had been perforated because he was able to palpate the end of the catheter in the right iliac fossa. Dr. Pfahler took a picture with the tube *in situ* and it was shown that it had pushed the lower border of the stomach down. It showed a very interesting picture of the danger accompanying the passage of the stomach tube.

DR. HENRY L. COIT of Newark, N. J., spoke of the etiology and prevention of pyloric obstruction and believed that the abuse of the saturated boric acid solution, so generally used for washing out infants' mouths, was sometimes if not often to blame for the occurrence of pyloric spasm, stenosis and even gastric ulcer.

DR. J. FINLEY BELL referred to a case of congenital hypertrophic pyloric stenosis shown before the New York Academy of Medicine and published in the *Archives of Pediatrics* of Feb. 11, 1909, in which no palpable tumor could be demonstrated after repeated examinations. This case was operated and a section of the muscle removed which proved microscopically to be normal muscular tissue. The excess of muscular tissue was sufficient to resemble a tumor, so that one could not state positively that the absence of a palpable tumor in a case of pyloric stenosis argued conclusively for pyloric spasm, and against actual stenosis.

One unfailing test is the character and amount of fecal matter which passes. If the stools are infrequent and small and consist largely of green mucoid material without much milk feces the child has a positive obstruction, probably anatomical at the pyloric orifice, and even though with a marked spasm element such a child should be operated while there is yet chance for withstanding the shock of an operation.

Dr. Pisek's work suggests that in the diagnosis and treatment of any continued abnormal digestive condition in infants the x-ray-bismuth method should never be omitted from the examination and must always precede rational treatment.

DR. WALTER LESTER CARR referred to those cases of pouched stomachs in which the peristaltic wave appeared to the left of

the median line. Many of these were cases of infants who were fed artificially and could not be classified as cases of pyloric spasm or pyloric obstruction, although showing a reversed peristaltic wave.

DR. GODFREY R. PISEK of New York, in answer to Dr. Graham of Philadelphia, said that in the normal stomach the contents invariably began to pass through within a very short time, *i.e.*, within a few minutes of its ingestion. In cases of pyloric tumor or of pyloric spasm the meal remained for some time and this fact was a very helpful point in the diagnosis. In cases of pyloric obstruction in which there was no tumor felt it might be found that no bismuth was extruded for a half hour and then suddenly in cases of pyloric spasm it would gush through. This aided them in making not only a differential diagnosis between true tumor and spasm, but in their prognoses in these cases. If there was found a fair amount of bismuth in the small intestines soon after the test meal the prognosis was good.

The cases Dr. Carr referred to were not those of pyloric obstruction. They were pictures introduced to show effects seen in unaffected babies. In artificially fed babies the contents appeared to pass readily through the pylorus.

The point made by Dr. Talbot he believed to be a very useful and good one; this was regarding the use of the subnitrate of bismuth when no radiographs were available but of course it would only show that something *could* go through the pylorus.

#### AN OBJECTIVE METHOD OF TEACHING FOOD VALUES AND FOOD REQUIREMENTS.

DR. CLIFFORD B. FARR, of Philadelphia, in teaching the principles of dietetics to medical students, nurses and more particularly to the general public (Baby Saving Show) makes use of charts, graduated cylinders containing colored fluids and permanent specimens of foods preserved in graduated containers. The charts are worded as tersely and emphatically as possible, covering for example: the definition of foods and foodstuffs, the principal foodstuffs and their functions, the principle of the conservation of energy as applied to metabolism, the explanation of the use of the calorie as a unit of food (energy) values, the caloric requirements at various ages with special reference to weight and body surface. Cylinders graduated in cubic centimeters (grams) and containing colored fluids, with explanatory labels, are used to show the amounts of the chief foodstuffs (protein, fat, carbohydrate, water and salts) needed at different ages, the composition of special dietaries and, in a somewhat analogous manner, the relative cost of important foods from a caloric point of view.

The permanent museum consists of 100 or more graduated bottles and jars, each containing a quantity of the food represented sufficient to produce 100 calories (method of Irving

Fisher). These are fully and distinctly labelled and formed into groups as follows: foods rich in protein, foods rich in fat, foods rich in carbohydrate, foods chiefly valuable for the salts contained, percentage mixtures and preparations used in infant feeding, diet for a child after weaning, various forms and preparations of milk (30) of equivalent food value, etc. The demonstration was supplemented by lantern slides.

"A METHOD OF SCORING THE VIABILITY OF INFANTS UNDER HOSPITALS AND INFANTS' WELFARE ORGANIZATIONS."

This paper was read by DR. HENRY L. COIT of Newark, N. J.

Most of the methods employed for recording the results of charitable work among infants show only gross numerical facts such as "improved," "unimproved," "cured" and "died." These figures constitute the total record of results of medical supervision over a great variety of cases and represent a wide range of physical defects and diseases. They do not, however, indicate the influence of philanthropy through medical supervision or instruction upon the most important of all results, namely: The living prospects of the infants which did not die.

The gross numerical method characterizes most of the published data whether it be from an infants' hospital, the infants' ward of a general hospital, an institution for foundlings or an orphanage and results of educational social work are usually recorded in like manner, either in the mortality records or the influence of the philanthropy upon the weight or environment of the infant without a comprehensive record of all factors contributing to the progress toward a normal physical condition.

In special hospitals, devoted to the care and cure of sick infants, it is usually difficult to keep the children under observation for a sufficiently long period to study to the full the effects of the work done in the hospital.

The infants' hospital, the educational work and the social service should be harmoniously interwoven into one system as a comprehensive whole with the hospital management as the directing head of the system. The social service idea was originally designed to extend the influence and fix the benefits of hospital work among the poor.

Philanthropic agencies acting alone in this matter will not be able to accomplish great and lasting good except with the aid of science and scientific facts and such supervision can only be had through institutions equipped for scientific study and research into the physical welfare of infants.

When these various kinds of work are combined under the same direction, it would be desirable if some simple system could be formulated for the collection of facts which would show the relative value of the various kinds of work whether philanthropic or scientific upon the reduction of infant morbidity and mortality.

In this way only can it be learned how the many causative factors of morbidity and mortality are related to one another, or by which method of procedure the best results can be obtained in our hospital and charity work. At present it is a matter of individual opinion and many questions cannot be satisfactorily answered.

The percentage plan of scoring has been employed to determine the status of social, scientific and commercial investigations, but no comprehensive scoring plan has been adopted which would include in its scope all conditions which influence the care, the physical condition and the living powers of the infant.

The method presented consists of a statistical score card, and is designed for the collection of facts to determine the influence of environment, of management, of nourishment and of morbidity upon the viability of the infant with a graphic chart to show the improvement in viability during a given time through the activities of a hospital, a medical philanthropy or educational work when directed to the betterment of the conditions which influence the life of the infant.

The chief object of such a system of scoring is to determine whether our work is worth while, whether we are barely saving the infants by carrying them across the living line, or whether we are giving them security and restoring them to a normal maximum of viability.

The scoring should be done each month by a statistician or the physician. It will not require expert judgment to estimate the value of the different factors as based upon the medical history or the records of the visiting nurse. It is also necessary that the nurse should interpret her records for the statistician who marks the score card.

The initial scoring of each case is based upon the medical history taken at the hospital or consultation when the child comes under observation and then from period to period the initial record should be checked on the intercurrent excursions from normal organic and functional integrity as indicated by the hospital record or the record of the visiting nurse, the variations being determined by the physician.

The principles of the system may be stated as follows:

*First.*—Simple and brief enough for clerical efficiency.

*Second.*—Comprehensive as to facts and figures.

*Third.*—Distinct divisions for separate estimations of sociologic, hygienic or morbid influences.

*Fourth.*—Correct distribution of the combined factor values.

*Fifth.*—Factor values not effected by varying individual or flexible judgment.

*Sixth.*—Graphic record of results.



## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN.

**Remote Results of Treatment of Fractures of the Lower End of the Humerus in Children.**—André Tréves (*Arch. de méd. des enf.*, Oct., 1912) has studied this subject in the clinic of Broca, Kirmisson and Mouchet. There are three forms of this fracture; supracondyloid with separation of the epiphysis and T fracture; fractures of the external condyle with intraarticular separation of the epiphysis; and fractures of the epitrochlear prominence. The author's observations are based on records of 325 cases. In the supracondyloid fracture, with the lower fragment projecting backward, the nerves and vessels are often injured. Osseous consolidation always occurs, a pseudarthrosis never resulting. Even when not reduced the deformity gradually improves, continuing to do so for several years. In this improvement are two elements, the growth of the bones, and the effect of the movements of the arm. The entire epiphysis is in the fractured portion and is not injured; hence it grows normally, and pushes the fracture further from the joint; thus the projections are carried further away from the joint and movements are less restricted. The osseous malformations are gradually absorbed. If parents and surgeons could be persuaded to wait for this process of repair to go on slowly we should generally get good results without operation, though one may even have to wait two years or more for them. The deformities of lateral displacement are less completely recovered from, but operation is not without danger, and may be followed by reappearance of the removed prominences. The final results of expectant treatment are good, pronation and supination being rarely limited. Out of seventy-eight cases, there were but two bad results. With fractures of the external condyle may come separation of the epiphysis. Consolidation of bone often does not take place in healing, but fibrous union takes its place. The functional adaptation of the articular surfaces is worse than in the first form of fracture described. Restoration of function is slower, but is often good. Bad results come from great anterior displacement, rotation of the fragment, and luxations. The functional result is good, but the esthetic is not so perfect, the arm remaining broad; muscular atrophy is frequent. In fractures of the epitrochlea prominence there is generally separation of the epiphysis. In more than one-third of the cases there is luxation of the joint. Visible deformity rarely remains, and movements are good. In the reduction of these fractures anesthesia is necessary to get good results. The arm should be fixed at an acute angle, which keeps the reduced fragments in



the best position. A simple plaster band around the two portions of the arm above the elbow keeps it in place, and allows of watching the joint, which is uncovered. Massage should never be used in the treatment of these fractures, nor should passive movements be made as they cause increased formation of callus and greater deformity. From ten to twenty days is sufficient for the dressing to remain in place, after which the child should be allowed to use his arm. Immediate operation is required only when there is a compound fracture, or irreducible luxation, with fracture of the epitrochlea or external condyle.

**Treatment of Congenital Club-foot.**—M. Savariaud (*Presse méd.*, Sept. 7, 1912) says that the surgeon who is treating club-foot should have at his disposal a series of means varying in accordance with the severity of the deformity, the social position of the child, and the amount of assistance to be expected from the mother or other persons surrounding him. Treatment should be begun as soon after birth as possible by daily replacing the parts under the direction of the physician. Between these replacements the foot should be kept in a normal position by some sort of apparatus. Later, to this treatment may be added, when needed, tenotomy and forced replacement under chloroform. After this, massage and apparatus are to be continued. In country children who will get less care operation on the bones may be done earlier; in the young child subcutaneous removal of the osseous nuclei from the bones, and in older children astragalectomy with cuneiform resection, may be done. Plaster apparatus must be applied at once. The patients operated on must never be lost sight of, lest we get bad results. This deformity is probably due to faulty position of the foot during intrauterine life, early in pregnancy. The result depends on the degree of the deformity, degree of reducibility, shape of the foot, age of child, and circumstances of life. A long flexible foot will give better results than a short stubby one.

**Operation for Pott's Disease of the Spine.**—Speaking of his operation which consists in fracture of the spinous processes of several adjacent vertebræ so as to produce fusion of the posterior aspects of the vertebræ and so to cause immobilization and relieve pressure, R. A. Hibbs (*N. Y. State Jour. Med.*, 1912, xii, 501) says that he has performed it in forty-three cases. In all, the wounds have healed without complication, pain has been slight and there has been no reaction from the operation. Eighteen of the cases have been without support for from three to twelve months and have shown no symptoms of disease or any increase of deformity.

**Results of and Indications for Surgery in Epilepsy.**—G. K. Collier (*N. Y. State Jour. Med.*, 1912, xii, 633) states that early in the patient's epileptic life, surgery may be of benefit, and but little can be expected in cases of long standing. Operations for the relief of epilepsy are undoubtedly disappointing and but seldom curative. All abnormalities calling for surgical treatment

should receive attention. Patients under surgical treatment should be most carefully observed, both previous to and following operation, and medical treatment should be continued. No epileptic should be pronounced as having recovered until two years, and better four years, have elapsed following operation. Lumbar puncture and venesection are of value in the treatment of status conditions in conjunction with other methods of treatment.

J. F. Munson (*Ibid.*, 636) says that the object of operative intervention in all cases of epilepsy is to remove a source of irritation or else to reduce intracranial tension, either through simple decompression or through a combination of the latter with drainage. In either case, a favorable result can only be expected in those cases in which the surgical procedure results in a minimum production of scar tissue. In traumatic cases, the time to operate is before the onset of the epilepsy. The examination of a considerable number of brains at autopsy has shown a surprising lack of cortical conditions, which could have been removed by the surgeons' knife. Out of about 375 brains examined at the Colony, only a very few showed anything which might have been treated by excision; this is, of course, exclusive of tumors. The writer urges that operations undertaken on account of the apparent focality of grand mal attacks be only done after the most serious consideration.

According to E. A. Sharp (*Ibid.*, 642) epilepsy is brought about by a variety of pathological processes, some of which occur before birth, some at birth and others during early life. Among such conditions may be mentioned cerebral and meningeal hemorrhages; encephalitis; the various forms of meningitis; thrombosis and embolism. Over 10 per cent. of the cases admitted to the Craig Colony owe the origin of their epilepsy to these causes producing infantile cerebral palsy, and they are among the most intractable of all the epilepsies. While the mortality from operations on the new-born has been high, it must be remembered that many of these infants would not live anyway, and those who do rarely become useful citizens. If by early operation we can prevent the paralyses, epilepsies and other disastrous consequences resulting from hemorrhages at birth, we should not be deterred by any consideration of the high mortality from operating on such infants. The surgery of epilepsy must be preventative rather than curative.

**Initial Location of Pulmonary Tuberculosis in Children and Adults.**—M. E. Rist (*Ann. de mèd. et chir. inf.*, Oct. 1, 1912) says that the first tuberculous lesions in the lung of the child do not occur at the apex, but at the base, in the lower lobe, accompanied of ten by a mass of enlarged glands at the hilus. Such a localization in an adult would be unusual. Percussion and auscultating would give no physical signs of such trouble. Radiography will at once show such a condition if it exists. Later in childhood we shall find the remains of such healed lesions

giving a cutaneous reaction, but clinically cured. Rapid radiography will show thickenings of the bronchial walls, bronchial dilatations, and masses of enlarged glands. Apical localization of tuberculosis depends on cough which carries the bacilli to the apex from other parts of the lungs; it is a reinfection. The determining factors in apical consolidation are the relatively poor ventilation and the immobility of the apices, which make then a good culture soil for the bacilli. In radiography cough clears the apex and makes it appear lighter; if this does not occur the apex has lost its flexibility and elasticity. This shows great and permanent alterations.

**Anemia of Alimentary Origin.**—Ad. Czerny (*Ann. de méd. et chir. inf.*, Oct. 15, 1912) says that in infants true anemia must be distinguished from mere pallor. Any child with gastrointestinal troubles may be pale, although the quick return of color when he is better shows that he has not been made anemic. This pallor is due to vasomotor constriction due to the intestinal conditions. The author believes that the anemia that occurs is due not to insufficient food but to its quality. Milk if used exclusively for many months does not always furnish all the nutrition that the child needs for development of all the organs. Normally, anemia never develops at the age at which the child takes milk exclusively; yet in some children this does occur, and it is lessened by giving carbohydrates and other food in addition to the milk. These children are congenitally predisposed to anemia, and are children of parents who are ill. The parents may be tuberculous or syphilitic. The anemia develops so gradually that we cannot say when it began. Pallor of the skin and mucous membranes may occur alone or be accompanied by enlargement of the spleen. At the same time that the child becomes anemic he grows fat, sometimes excessively so. This is caused by a milk that is rich in cream. These children have soft, flabby muscles. There is need of carbohydrates which are not furnished by the milk. Treatment by iron alone will not cure the anemia unless gruels and cereals are also given. Eggs are useful to furnish iron. At the same time the amount of milk should be reduced and food should be given but four times in the day. The author believes that in these children there is a lack of alkalies in the blood resulting from the formation in the intestine of soaps of lime from the fat of the milk. Reducing the milk and giving a mixed diet lessens this production of soaps and increases the alkalinity of the blood.

**Somnolent Uremia in Infants.**—Nobécourt and Maillet (*Jour. de méd. de Paris*, 1912, No. 42, 795) believes that a not very uncommon form of uremia in infants, in which the child is in a partial stupor, may be mistaken for tuberculous meningitis. The symptoms are emaciation, somnolence, unstable pulse, irregular fever, and myosis of the pupils. The decisive test is made by examination of the cerebrospinal fluid withdrawn by lumbar puncture, which will be found to contain much albumin and an

abnormal amount of urea, more than a gram per liter having been found by the author. All the clinical symptoms simulate tuberculous meningitis. In tuberculous meningitis there may be mydriasis and fixed gaze. In meningitis the rhythm of respiration is not altered, while in uremia there are marked modifications, even Cheyne-Stokes respiration. The symptoms of uremia in the infant differ from those of the adult in the occurrence of this somnolence. A degree of uremia that will produce this condition will give a very grave prognosis.

**Mastoid Inflammation in the Infant.**—Marcel Zaepffel (*Rev. mens. de gyn., d'obst. et de gyn.*, Oct., 1912) says that it is unfortunate that a discharge from the ears in a young child is frequently regarded as of little importance. The slightest inflammation in the ear and mastoid region should be considered as of grave import and as demanding immediate operation on the mastoid. Mastoid inflammation is not always caused by otitis. Attention is drawn to the necessity of differentiation between true mastoid inflammation and postauricular inflammation. Mastoiditis generally supervenes gradually, following an otitis media, with a diminution of the discharge from the ear, and an increase of pain and fever. Deep pressure becomes painful at the base of the mastoid apophysis. Otoscopy shows exfoliation of the posterosuperior wall of the auditory canal; the tympanum is red, bulging, and later perforated. On the other hand, when retroauricular lymphangitis exists superficial pressure causes pain, there being an area of red, wrinkled skin behind the ear, which is very edematous. There are small, enlarged glands, movable under the deeper layers of the skin. This condition may follow impetigo, eczema, or furunculosis of the auditory canal. A symptom that is important is the intense pain that is given by drawing the auricle upward and backward. Otoscopic examination of the tympanum is negative. In mastoiditis, evacuation of the pus by the canal, and application of ice to the mastoid region are important. In retroauricular inflammation hot, moist applications are best and will generally prevent the formation of an abscess.

**Diet in Scarlet Fever.**—Mathilde de Biehler (*Arch. de méd. des enf.*, Oct., 1912) states that many modern authors have rejected the absolute milk diet in scarlet fever, for the prevention of albuminuria and nephritis. Some have given a mixed diet without meat, while others have allowed meat also. The author's attention was drawn to the small number of cases of nephritis that she found occurring after scarlatina in the working classes, where it was difficult to get a strict milk diet, and where the child was given pretty much what the rest of the family ate. In ninety-three cases of scarlatina she found eleven of albuminuria, and this disappeared at the end of a few days; there were five cases of nephritis. In families where several children has scarlatina at the same time she had one child take milk alone, and others mixed diet, with or without meat, and compared her results.

Among forty-nine children who took milk diet, she observed four instances of passing albuminuria and one of nephritis. Among twenty others who had mixed diet without meat there were no albuminurias and one nephritis. Among persons of the better classes it is difficult to experiment since they are convinced that meat is harmful, but vegetables, eggs, and fruits are welcomed. Of sixty such children on mixed diet without meat eight had albuminuria and two nephritis. Of nineteen on milk alone, three had albuminuria, none nephritis. She concludes that we should not reject the milk diet, but should order it in all severe cases of nephritis. In children in good hygienic surroundings mixed diet without meat seems to do little harm, and it is much more agreeable for the children. The meat diet gives more cases of nephritis than the mixed diet without meat. The author gives milk during the first ten days, and then adds coffee, cocoa, eggs, vegetables, fruits, and bread during the second and third weeks, meat being given only in the fourth week.

**Combat against Tuberculosis among Children.**—Nietner (*Lancet*, Nov. 16, 1912) emphasizes the fact that tuberculosis is a true children's disease. The lung is probably the usual primary area of infection. In its diagnosis a temperature record is of prime importance and should be taken every two or three hours. The x-ray is of value, especially for the detection of bronchial glandular involvement. Tuberculin tests are most useful. As preventive measures, the marriage of tuberculous women should be strongly discouraged and tuberculous mothers should not nurse their children. The only means of isolating tuberculous families which has proven not too expensive in Germany is the construction of one or two family houses. A pure milk supply is of great importance. Traveling tuberculosis exhibitions do much for popular enlightenment. Breast-feeding must be advocated. The baby should be kept away from the infected member of the family. Dangers which must be avoided are the use of the "comforter," the tasting of the first spoonful of food to encourage the child to eat or to test its temperature, the cleaning of the child's face with the parent's handkerchief and saliva, and kissing on the mouth. The danger from tuberculous teachers is probably exaggerated, but both teachers and scholars who eject tubercle bacilli should be excluded from school, pensioning the teachers meanwhile if necessary. A careful examination by the school physician is of the utmost importance and this official should be a whole-time appointee with time to be thorough. The value of a school dentist is recognized in Germany, as 90 per cent. of children have affected teeth. Instruction regarding the prevention of infectious disease, particularly tuberculosis, together with lessons in general hygiene, should form an obligatory part of the school syllabus, and could best be incorporated with teaching in natural science. Such instruction is best administered by the school teachers, who should, however, be trained by the medical profession for this duty. School hygiene should include the



furnishing of facilities for frequent shower baths, abolition of the common drinking cup, compulsory eversion of the head and covering of the mouth with a handkerchief when coughing, supply of spittoons, lightening of school work of children who show signs of latent tuberculosis and instruction in separate classes of children with open tuberculosis. The class work must be adjusted to the physical capacity of the children.

**Livido in Children.**—J. Comby (*Arch. de méd. des enf.*, Nov., 1912) describes in children a condition of mottling of the skin, local or general, in which patches of white skin are surrounded by passively congested areas of a reddish-violet color. This condition may be transient or permanent. It may be observed at all ages. It is seen in syphilitics in the myxedematous, and the Mongolian child, and with scrofula, tuberculosis and rachitis. It may be a family affection in arthritic or nervous families. There are no subjective symptoms. It disappears with increase in age, and never persists until adult life. Treatment is given by friction, baths, thyroid extract, and adrenalin.

**Typhoid Spondylitis in the Child.**—Ardin-Delteil, Maurice Raynaud, and Max Coudray (*Arch. de méd. des enf.*, Nov., 1912) have studied anew the nature of spondylitis occurring in typhoid in the child. They affirm that in children as well as in adults typhoid spondylitis may be observed; it evolves more rapidly in the child, but may disappear in five or more weeks, and the involvement of the bones is less. Besides marked osteoarthropathic lesions, there is a meningoradicular syndrome with a true spinal meningitis; this is quite as important as the affection of the bones, and should be looked for in all cases. Lumbar puncture, even more than immobilization of the spinal column seems to give relief to the patient and sedation to the pains. It should always be used in treating such cases.

**Local and General Reactions to Tuberculin in Children.**—M. Phu (*Arch. de méd. des enf.*, July, 1912) says that for practical, everyday use the von Pirquet method is better than the conjunctival reaction, because the latter may cause an inflammatory condition of the eye. The subcutaneous injection gives rapid absorption and passes quickly into the circulation, but it is not so convenient as the cutaneous and conjunctival reactions. It requires that the temperature should be taken frequently and careful observations made both before and after the injection. The skin reaction is the most harmless, causing no possible local lesion of tuberculosis. The subcutaneous injection is objectionable on account of the fever which it causes, and its dosage is more difficult. In the nursing the tests with tuberculin give uniform results, but do not distinguish between a latent and an active tuberculosis, or between a normal and a slightly pathological condition. Results are uniform up to about four years of age.

**Osseous Traumatisms in the Child.**—Kirmisson (*Presse med.*, Sept. 4, 1912) says that the thickness and elasticity of the periosteum of the child has a marked effect on the lesions produced by accidents; therefore, the subperiosteal fracture is frequent. The incomplete,



or green-stick fracture is also common. Subperiosteal fractures occur often in the leg, without displacement or crepitation, with little abnormal motility, pain, or difficulty in walking. The incomplete fracture is seen in the neck of the femur. The child continues to walk after the accident, but some time later develops a shortening and limp which immediate treatment would have obviated. In the upper extremity the incomplete fracture is seen in the clavicle especially. There are a little pain, slight limitation of movement, and an exaggeration of the normal curvature of the bone. In the humerus the fracture may be diagnosticated by radiography. In the forearm these fractures are frequent. There may be fracture of the lower end of the radius with luxation of the joint. The luxation may pass unnoticed; the fragments override, and if the fracture is not properly treated marked disability may result, amounting even to ankylosis of the joint. In some bad cases there is nonunion and a pseudarthrosis occurs.

**Transmission of Poliomyelitis by the Stable Fly.**—In the experimental work of J. F. Anderson and W. H. Frost (*Lancet*, Nov. 30, 1912) three monkeys exposed daily to the bites of several hundred stomoxys, which at the same time were allowed daily to bite two intracerebrally inoculated monkeys, developed quite typical symptoms of poliomyelitis eight, seven and nine days respectively from the date of their first exposure.

**Possible Transmission of Poliomyelitis through the Dog.**—H. F. Langhorst (*Jour. A. M. A.*, 1912, lix, 2312) says that poliomyelitis is undoubtedly transmitted to man by more than one intermediary. In addition to the stable-fly and the monkey he believes that the dog may be one of the agents of transmission. This idea is based upon two cases in his practise. One was a man attacked with fatal anterior poliomyelitis. The patient's dog had been sick about two or three weeks before, and was unable to stand on its hind legs. The patient fed the dog and cared for him. The patient remembered that he had a few scratches on his hand, and that on one or two occasions, the dog licked his hand. Flexner has shown that the nasal mucosa is one of the points of egress of the virus. If the dog had been inoculated with the virus at some time and had not immediately contracted the disease, he may have been a carrier and not contracted the disease until his vitality was lowered by living in a kennel in the cold weather. The dog could have inoculated his master with the secretions from his nose and mouth.

**Drainage in Empyema.**—Discussing the drainage of empyema cases by the ordinary method and by such suction apparatus as von Ebert's drainage tube, P. K. Menzies (*Univ. Toronto Med. Bull.*, 1912, i, 4) says that total exclusion of air from the pleural cavity favors the most rapid recovery. Cases recover more rapidly where a partial vacuum is obtained than when the pleural cavity is left open during drainage to the outside atmospheric pressure. A vacuum, even for a few days, is valuable, for in that time adhesions may form between the walls of the pus cavity, and so prevent the later collapse of the lung, when air is admitted to the pleural cavity.

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CHORIONIC VILLI IN THE UTERINE WALL EIGHTEEN  
YEARS AFTER THE LAST PREGNANCY.

A CONTRIBUTION TO THE PATHOGENESIS OF MALIGNANT  
CHORIOEPITHELIOMA.

BY  
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(With Five Illustrations.)

MALIGNANT chorioepithelioma may be observed with or without a preceding pregnancy. The cases of Schlagenhauser (chorioepithelioma in the testicle) and Pick (chorioepithelioma in the ovary of a child) are classical types of chorioepithelioma without preceding pregnancy.

The pathogenesis of the cases without preceding pregnancy can only be explained by one of two hypotheses—congenital misplacement or parthenogenetic development.

The first hypothesis supposes that during the early development of a fetus some of the trophoblast may become misplaced into the substance of the fetus, lie dormant there for an indefinite time and then begin to develop into a malignant tumor of the type of the chorioepithelioma. This would mean a metastasis from one part into another part of the fetus. The second hypothesis supposes (and this can only be claimed for the female, as long as nobody has had the temerity to imagine parthenogenetic development of the spermatozoon) that an ovum may undergo parthenogenetic development to the stage of the formation of a trophoblast, other tissues failing to grow, but the trophoblast forming the basis of a subsequent chorioepithelioma.

This would amount to a lower stage of development of a woman's child. It would mean the metastasis of the trophoblast of the offspring, a true parthenogenetic offspring, into the mother.

Both of these hypotheses lack the foundation of actual observation. Nobody has ever seen a fetus or a new-born child with trophoblast in its tissues, nor has anybody actually observed the presence of trophoblast in an ovary except in cases of real ovarian pregnancy.

While these cases of chorioepithelioma without preceding pregnancy are extremely rare, great numbers of chorioepitheliomata have been observed following a pregnancy of some kind. All of these cases have that in common that they have had a full development of a trophoblast and represent a metastasis of that trophoblast of the fetus into the mother. This holds good, whether the pregnancy was uterine or extrauterine, whether it ended at full term or prematurely, whether the product was a normal or an abnormal placenta (hydatid mole).

The pathogenesis of these cases is very much clearer than that of the cases without preceding pregnancy, because we have actual observations in considerable number which show varying physiological degrees of invasion of the mother by the trophoblast of the fetus.

Aside from older observations by Leopold (*Archiv. für Gynaekologie*, vol. xi, 12) and myself (*Zeitschrift für Geburtshülfe*, vol. xxiv), more recent papers by Poter (*Archiv für Gynaekologie*, vol. lxvi, 1902), Kworostansky (*Archiv für Gynaekologie*, vol. lxx, 1903), Meyer (*Zeitschr. für Geburtshülfe*, vol. lviii, 1906) and others have demonstrated very fully that fetal elements invade the uterus from the first to the tenth month of pregnancy and are to be found there for several weeks in the puerperium. Not only the cells of the epithelium of the chorion, Langhans layer as well as syncytium, either or both, have been discovered in the uterine wall and its veins, but entire villi. From many observations it has become clear that under normal conditions these chorioepithelial cells disappear and these villi perish without causing any further symptoms. Further researches of Schmorl, Lubarsch and Pels-Leusden have demonstrated that chorioepithelial cells can be carried by the circulation to distant organs, more especially the lungs.

These observations furnish the prototypes of invasion of the mother by the trophoblast of the fetus under normal conditions without subsequent malignancy. They explain why malignant

tumors which—the unknown principle of malignancy supervening—start from these chorioepithelial cells, can be found primarily in the uterine wall or in distant organs, for instance the vagina or brain (ectopic chorioepithelioma), even if the uterine cavity is free from tumors and to all appearances normal.

The pathogenesis of these cases is therefore well illustrated by actual observations of related conditions within physiological limits.

There is, however, a peculiar class of cases in which it is not easy to perceive the connection of the chorioepithelioma with preceding pregnancy, because the time which elapsed between that pregnancy and the observation of the tumor has been excessively long.

In a paper by Kroesing (*Archiv für Gynäkologie*, vol. lxxxviii, 1909) a number of cases are collected in which long periods of time have elapsed between the last pregnancy and the occurrence of the tumor. In one case the menopause had occurred one and one-half, in another three and one-half years before the tumor symptoms began. Three cases are mentioned of the age of fifty-two years, one of fifty-eight years. McCann in 1903 (*Journal of Obst. and Gyn. of the British Empire*) described a case nine years after the last pregnancy and eighteen months after the menopause. Devitzky (*Meditsinskoe Obozrenie*, 1904) demonstrated to the Moscow Medical Society a case of chorioepithelioma in a woman seventy-five years old. Polano (*Zentralblatt für Gynaekologie*, 1912, p. 1228) describes a case of a chorioepithelioma of vulva and vagina in a woman fifty-two years old who had had her menopause one year before and had had her last pregnancy ten years before.

How are we to explain these cases? Did they start from long-surviving chorioepithelial elements in the uterus or do they all belong to the same type as Pick's observation of the child with the chorioepithelioma in its ovary where there was no possibility of pregnancy?

So far there has been no actual observation of villi or chorioepithelium surviving for long periods. However, the unique case which is to be described here, tends to throw considerable light on this question.

*History.*—A colored woman of forty-five years, born in British Guiana, came to my clinic at the Post-Graduate Medical School in April, 1912, on account of hemorrhages from the uterus.

Her first menstruation occurred at the age of fourteen years. Her periods were always protracted lasting about seven days

until after she became married. She was married at the age of eighteen and had four full term labors, twenty-six, twenty-three, twenty and nineteen years ago. Her pregnancies were normal. The deliveries were natural, there never was any excessive hemorrhage or any infection. She nursed each of her children for about four months. She had four abortions, the first twenty-two, the last eighteen years ago. She knows of no cause for the abortions. The abortions always terminated naturally and were not followed

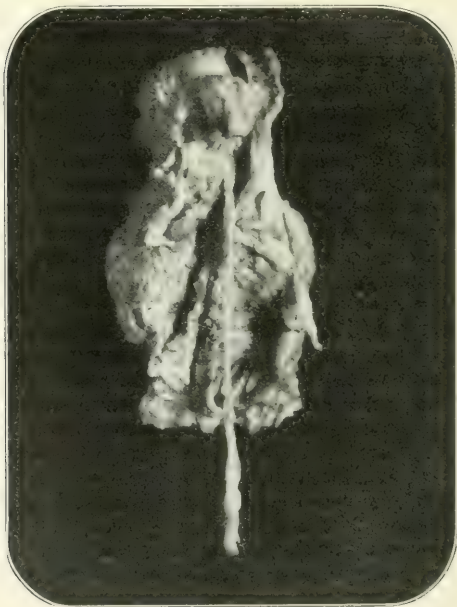


FIG. 1.

by any signs of infection. She knows nothing of any special hemorrhages during these prematurely terminated pregnancies.

Since her marriage her menstrual periods were never more than four days. For over eight months before coming to the clinic her menstruation had become prolonged, more copious and more frequent, so that she menstruated every two weeks and flowed for five to ten days, passing clots at times. The loss of blood was so considerable that she had frequent attacks of faintness during the menstruation for the last eight months. She has

not noticed any enlargement of the abdomen, but has observed swelling of the feet.

Examination revealed as the cause of her symptoms an irregular mass of fibroids of the uterus. It was somewhat larger than a child's head, occupied the body of the uterus and left the cervix free.

On April 23, 1912, I removed the body of the uterus with the appendages. The operation presented no unusual features. The recovery of the patient was perfectly smooth and she left the hospital on the sixteenth day after the operation in good health. The last examination of the patient was made in November, 1912, at which time she was found in perfect health and able to work.

The interesting part of this case is centered around the specimen removed.

*Specimen.*—The uterus is of the size of a child's head and is full of multiple fibroids of the subserous and intramural varieties. The appendages are normal. The uterine cavity is smooth and lined with a thin mucous membrane. What attracted attention first of all was a peculiar, whitish, movable, translucent, thread-like formation which protruded from the cut surface of the uterus where it had been separated from the cervix (Fig. 1). This thread protrudes 3 centimeters from the cut surface. On dissection it is found to be contained in a large vein. When this vein is opened and followed upward the thread is found to reach the left uterine horn where it is attached to the wall of the vein, while everywhere else it is hanging free in the lumen of the vein. The thickness of the uterine wall here is about 3 centimeters. The thread has no lumen. Its diameter is from 1 to 3 millimeters. Its lower end is slightly club shaped. The total length is 9.4 centimeters. Very small semiglobular or slightly club-shaped excrescences are distributed along its entire length. Similar but shorter and thicker threads with more distinct branches are found in other large veins of the left uterine horn. In a cross-section through the uterine horn one vein presents itself filled with these whitish formations in the shape of a small bunch of grapes. This bunch can be lifted out. Several veins on the cross-section appear filled with similar formations. These can be followed from the mucosa to immediately under the serosa. The rest of the uterus presents nothing abnormal.

The following parts are examined microscopically:

1. The small grape-like mass taken out of a vein of the uterine horn (Fig. 2).

2. A split-off piece of the long thread-like formation.

3. Several blocks of cross-sections through the uterine horn, including the mucosa.

4. Some of the fibroids.

Celloidin imbedding. Staining with hematoxylin-eosin, Van Gieson.

1. The grape-like mass (Fig. 2) on section consists of round or



elliptical, frequently branching, formations of the size, shape and appearance of chorionic villi which have undergone fibrous and hyaline degeneration. Their surface is covered with one row of flat cells with large round or elliptical nuclei. The nuclei appear vesicular and have one or more distinct nucleoli. This cover of epithelial cells is present everywhere, though very delicate in places. It surrounds a substance which consists of wavy, homogeneous broad bands which stain well with eosin, but are particularly well seen with Van Gieson stain. The latter shows them to consist of many fine fibers which stain bright red with the fuchsin. These bands have no nuclei. In between them numerous vessels are found, capillaries and small arteries with



FIG. 2.

distinct muscular wall and veins. The vessels frequently contain well-staining erythrocytes without nuclei. Long slender cells with elongated nuclei, connective-tissue cells are lying here and there between the bundles of homogeneous fibers. A few rounded cells with darkly stained nucleus and oval body which is stained bluish, are seen now and then, plasma cells.

2. The inferior end of the long thread which protruded from the vein on the cut surface was cut in two longitudinally for about 1 centimeter and one side removed. This split-off piece

shows in its substance the same homogeneous bands of wavy connective-tissue, many capillaries with hyaline bands around the endothelium and with well-stained erythrocytes without nuclei in the lumen. Long connective-tissue cells are arranged in the longitudinal direction of the thread and have distinct nuclei. There is no surface epithelium on this thread. Instead of it there is found a network of darkly stained broad bands. Nuclei of the same kind as those described above as the covering of the villi are scattered along its outlines. In the meshes of the network are seen many fresh erythrocytes.

3. Cross-sections through the uterine horn:

The mucosa is 3 millimeters thick. The surface epithelium is well preserved. The glands are almost straight or very slightly tortuous, their epithelium shows no abnormality. The interstitial tissue is rich in cells which are of the ordinary type without any decidual changes.

Immediately under the mucosa a small myofibroma is seen with the usual arrangement of parallel and interlaced fibers. Just below this fibroid a wide thin-walled vein of the capsule of the fibroid is seen in which one or two villi are seen lying free in the lumen. They correspond exactly with those of the grape-like mass described under 1.

Proceeding deeper into the muscularis of the uterus there are seen cross- and longitudinal sections of a vein which branches and twists through the field. This vein is practically completely filled with villi (Fig. 3). There is no blood visible between these villi or between them and the vessel wall. As numerous sections are made the vein with its contents can be followed to a considerable distance and it is evident that the villi filling the vein are one continuous mass. The individual villi appear round or elliptical, frequently flattened against each other in various curves. At several points branches can be seen starting off from stems of villi.

The structure of these villi varies in so far as some show nothing but the homogeneous wavy bands with hardly any nuclei (as under 1), while others show more connective tissue particularly in the neighborhood of the vessels of the villi (Fig. 4). The latter observation is made especially at the points where the villi are attached to the wall of the vessels (Fig. 5).

At several points in the sections the villi invade the substance of the uterus so that one part lies free in the vessel while another part of the villus loses itself in the uterine wall. At the points of attachment the muscular wall of the vein is interrupted and the homogeneous material of the villi enters between the muscle and connective-tissue bundles of the uterine wall. It is at these points particularly that bundles of connective-tissue cells enter the villi and follow the blood-vessels in them. The epithelioid lining which is present everywhere else is absent at these points of attachment. Everywhere else the epithelioid lining of the villi is exactly the same as the endothelium of the vein. There is

no syncytium and there are no Langhans cells to be seen anywhere in any of the sections.

The degenerated homogeneous ends of the villi are found at some distance from the venous wall apparently unconnected with the villi. But the connection is easily established by looking over the great number of sections which were made. There is

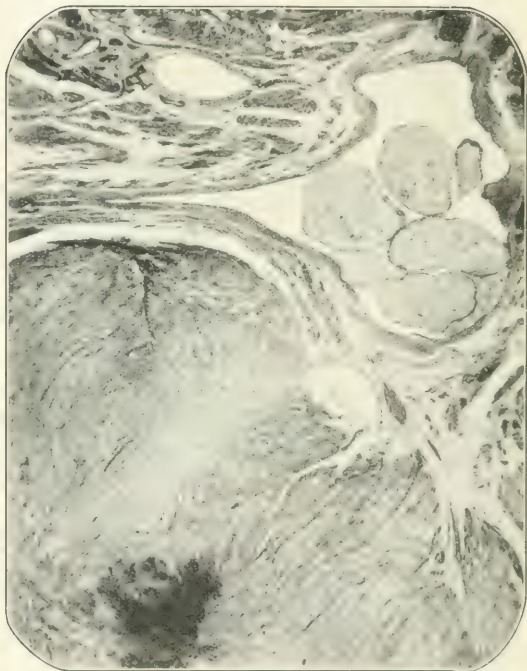


FIG. 3.

no reaction of the uterine muscular wall in the shape of round cell infiltration or any other reaction against the invading villi.

A few of the villi show calcareous deposits in hyaline tissue.

In two blocks small fibroids are seen which have undergone partial hyaline degeneration and show calcareous deposits in the hyaline part (Fig. 3). The veins in the capsule of these fibroids are filled with villi.

The size, the shape, the arrangement of the peculiar formations found in the veins have caused me to call them villi, though I have found no chorioepithelial elements at any place. The epithelioid covering of the villi is so absolutely like the endothelium of the veins in which the villi are lying that I have no doubt but that the covering of the villi is of endothelial nature too, simply a continuous growth of the endothelium of the vessel onto the villi. The arrangement of the villi in bundles and

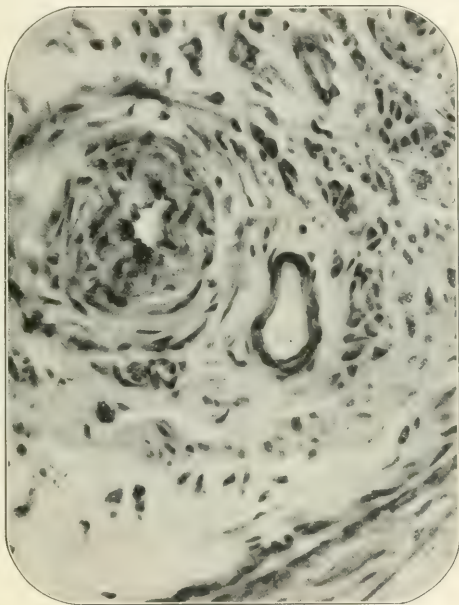


FIG. 4.

grape-like masses in the veins, the fact that they are multiple and distinct formations inside the lumen of the vessel are sufficient evidence that they cannot be thrombi. There is no other known condition which would simulate such a picture.

In comparison with cases in the literature this case represents a few points for special consideration. For instance it is worth while remembering that the invasion of the uterine wall by chorionic epithelium and villi is peculiarly favored by the pres-

ence of fibroids (Kworostansky, see above, p. 184) and that the uterus described here was full of fibroids. Poten (see above) found a villus in a vein of the uterus 1 centimeter from the serotina. The stroma of this villus was shrivelled. Poten also mentions that the villi in his observations lay free in the veins without producing coagulation of the blood. The veins in our case show no thrombi either and there is no fibrin deposited on the villi except at the lowest end of the long villus described under



FIG. 5.

Here the endothelium was absent over the substance of the villus.

The presence of the long villus in the vein of the uterus extending toward the cervix in this case is particularly suggestive with regard to the many cases of primary chorioepithelioma in the vagina and vulva.

This report has been entitled "villi in the wall of the uterus eighteen years after the last labor," but this does not mean that the possibility of these villi having been in the uterine wall longer than that, is denied. We have no way of telling whether

these villi invaded the uterine wall in one of the preceding pregnancies and remained there unchanged during one or more subsequent pregnancies. All we know is that there was no pregnancy for the last eighteen years.

This case presents therefore the unusual feature of degenerated villi found in the veins and in the wall of a fibroid uterus eighteen years after the last pregnancy. It tends to clear up the pathogenesis of those cases of chorioepithelioma in which the tumor did not arise until many years after the last pregnancy. True, no chorionic epithelium was found on these villi. The epithelium-like covering of the villi which was observed cannot be considered anything but endothelium. We do not know at what time since the last pregnancy the chorionic epithelium became lost and was replaced by vascular endothelium. The absence of chorionic epithelium does not militate against the possibility of a chorioepithelial tumor originating from these villi at some time during the eighteen years which had elapsed between the last pregnancy and the removal of the uterus. The absence of the chorionic epithelium is evidently one of the reasons why in this case no chorioepithelioma was formed.

The importance of this case lies in the fact that it presents the hitherto unparalleled picture of a benign survival of chorionic villi in the uterine wall for as many as eighteen years after the last labor.

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## THE DIFFICULTY OF PRODUCING STERILITY BY OPERATIONS ON THE FALLOPIAN TUBES.\*

BY

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The importance of preventing the repetition of obstetrical mishaps in certain cases by rendering the patient incapable of further conception has long been recognized. Among the earlier operators the removal of the uterus, the ovaries, or both, to accomplish this purpose, was not uncommon. With the recognition of the ovary as an important gland of internal secretion, however, such radical measures rapidly fell into disuse and attempts were made to accomplish the same result by the production of atresia at some point in the

\*From the Gynecological Clinic of the Johns Hopkins Hospital.



genital tract. The Fallopian tube naturally presented itself as the logical point of attack.

As early as 1836 Blundell advised section of the tubes to prevent conception in cases in which delivery was sure to be difficult. According to Blietz(1), Froriep in 1850 attempted to obliterate the uterine orifices of the tubes by cauterization with silver nitrate, introduced by means of a uterine sound especially made for the purpose. In 1878 Kocks, with a similar instrument, endeavored to accomplish the same result with the galvanocautery. Neither of these methods was destined to any extensive use.

*Ligation of the Tubes.*—In 1875 Kossmann, according to Ronsse(2), ligated the Fallopian tubes of several chickens with heavy silk ligatures. Six weeks later these hens began to lay. At autopsy he found the ligatures heavily encrusted with lime salts and broken by the swelling of the tissues which had followed the ligation. Zweifel and Thomas were probably the first to attempt this method of sterilization in the human being. During the course of a Cesarean section, they placed a heavy silk ligature about the middle portion of each tube with the object of preventing a second conception. Despite Kossmann's early experimental evidence of the inefficiency of this method, it gained rather wide application. Several observers, however, were soon brought to a realization of the uncertainty of its results. About 1895, Pissemsky(3), Sutton(4), and Fritsch(5) published cases of pregnancy following ligation of both tubes with silk, while Kossmann(6) and Arenat(7) experienced similar failures after the use of catgut ligatures. Perhaps the most conclusive clinical evidence of the uselessness of the procedure thus far published appeared in the *Medical Press and Circular* in 1904. Taylor(8) twice performed Cesarean section on a rachitic dwarf, applying ligatures to both tubes on each occasion. Nevertheless, the patient again became pregnant and Martin did a third Cesarean section and double salpingectomy together with the removal of a wedge-shaped piece of uterine cornu on each side.

Of the twenty-three instances in the gynecological clinic of the Johns Hopkins Hospital, in which it was deemed advisable to attempt sterilization by ligation of the tubes, fourteen cases have been successfully traced. Of this number, five were over forty years of age at the time of operation. Two of the remaining nine cases became pregnant after operation. A brief account of their histories follows:

Mrs. R., age twenty-nine, entered the hospital in June, 1908, complaining of pain in the back and feeling of weight in the lower abdo-

men. She was married at the age of fifteen and had since had eight children at full term and two miscarriages. Each of these eight labors was prolonged and difficult, the patient remaining in bed from four to six weeks after each delivery. On examination, the vaginal outlet was found markedly relaxed, the cervix lacerated and hypertrophied and the fundus uteri in retroposition. At operation, the cervix and perineum were repaired and the abdomen then opened. Owing to the fact that the patient had had eight difficult labors, it was thought best to fix the uterus to the anterior abdominal wall and prevent further conception by ligation of the tubes with silk. Recovery from operation was uneventful. One year later this patient after an easy labor was delivered of a full-term child.

Mrs. Y., age thirty-seven, entered the hospital in January, 1903. She had had a very difficult labor seven years previously and had not been well since. On examination, the uterus was found in marked retroposition and the vaginal outlet considerably relaxed. The perineal laceration was repaired and the uterus suspended by the Webster method together with shortening of the uterosacral ligaments. Convalescence was satisfactory. Three years later the patient was delivered of a full-term child after a very difficult labor. She entered the hospital in January, 1908, and the perineum, which was again badly torn, was restored. The following year the patient again presented herself, complaining of dragging pain in the lower abdomen. On examination, the uterus was found in extreme retroposition. Dr. Casler's operative note during this admission is very interesting: "The uterus has been previously suspended by the Webster method, together with shortening of the uterosacral ligaments. Examination now shows that the round ligaments have pulled out and become gradually lengthened so that the uterus is now in extreme retroposition. The round ligaments can easily be seen coming through the broad ligaments. The patient has had a number of children (five) and as she is very anxious to be perfectly well, it was thought best to ligate the tubes and fix the uterus. The tubes were doubly ligated with silk and the uterus fixed to the recti muscles in front with two silk sutures."

Since this operation in May, 1909, the patient has had three miscarriages,—two at the second and one at the fourth month.

*Section and Resection of the Tubes between Two Ligatures.*—Impressed by the failures of simple ligation of the tube to effect sterilization with any degree of surety, Kehrer(9) cut the tube between two catgut ligatures placed about the isthmus. A case reported by Abel(10) in 1899 offers evidence enough of the doubtful results to be obtained by this method. The patient coming to operation for a second Cesarean section in 1894, the tubes were doubly ligated with silk and cut between the ligatures. Three years later the patient again became pregnant. At her third operation both tubes were found to have become reunited and one was patent throughout its entire length.

Fritsch, going further, excised a centimeter of tube between two ligatures. The observation of Cripps, Zweifel and Williamson, as well as the failures of a modification of this method described below, show conclusively that resection of the tube promises little if any better results than simple section or ligation.

*Resection of Tubes Between Two Ligatures with Burial of the Uterine End.*—Braun-Fernwald<sup>(11)</sup> and Rühl<sup>(12)</sup> after cutting the tube between two ligatures, buried the uterine end in the broad ligament at the side of the uterus and closed it over with peritoneum. On the occasion of a second laparotomy in one of his cases, Rühl found the uterine end of the tube opening freely into the abdominal cavity. A case from the Bonn Klinik, reported by Reifferscheid<sup>(13)</sup>, also demonstrates the uncertainty of this method. Frau F., who had had one Cesarean section on account of a markedly contracted pelvis, presented herself again pregnant, but would consent to a second laparotomy only with the promise of sterilization. At operation, 2 centimeters of each tube were resected between two nonabsorbable ligatures. The uterine stumps were buried and closed over carefully with peritoneum. One year later the patient became pregnant. A third Cesarean section being refused, she was subjected to a therapeutic abortion.

*Section of the Tubes by Means of the Cautery.*—Kossman, believing that by cauterization of the cut ends he could effect a thorough and permanent closure of the lumen, cut the tube between two ligatures and then applied the actual cautery to the sectioned surfaces. Fränkel, working on animals, cut the tube between two ligatures and cauterized the cut ends thoroughly for a distance of 1 centimeter. He found the method to be entirely inadequate, as complete atresia was not produced.

*Bilateral Salpingectomy.*—As ordinarily carried out, the removal of both tubes leaving a short stump at the uterine end gives no assurance of sterilization. Many cases of pregnancy following the procedure have been reported. Schmidt<sup>(14)</sup>, operating in a case of advanced pelvic inflammatory disease, found it necessary to remove the left ovary and both tubes. He tied the uterine ends of the tubes with silk ligatures and removed them, leaving a stump on each side 1.5 centimeters in length. Four years later the woman became pregnant. Dr. J. O. Polak<sup>(15)</sup>, of Brooklyn, has lately reported three cases of pregnancy following salpingectomy. One of these, a young woman infected with gonorrhea shortly after marriage, had remained sterile. At operation, both tubes were removed, leaving

a ligated stump 1.5 centimeters in length at each cornu. Several years later the patient returned with severe abdominal pain and uterine hemorrhage. She had missed one menstrual period. On opening the abdomen, an interstitial pregnancy was found on the right side and excised.

A somewhat similar case has been experienced in this clinic. S. S., a young negress, aged seventeen, first came to the hospital in September, 1906, complaining of pain in the lower abdomen. On examination a small inflammatory mass was made out on the left side. At operation the left tube and ovary were removed by Dr. Rushmore, leaving a small pedicle of tube attached to the uterine cornu. Two years later, the patient was brought to the hospital desperately ill. She had been having some abdominal pain for ten days but on the night of admission, while at stool, was suddenly taken with stabbing pains in the lower abdomen. The last menstrual period had been abnormal in that instead of the usual free flow there appeared only a slight show. On examination the lower abdomen was rigid and extremely sensitive. There was a slight bloody, vaginal discharge. Temperature 98°, pulse 130, respiration 30 and hemoglobin 35 per cent. At operation Dr. Casler found the abdomen filled with clotted blood. On the right side the tube and ovary were bound down by adhesions but the tube was patent throughout. On the left side where the tube and ovary had been previously removed was found the short stump of the uterine end of the tube, containing a ruptured gestation sac not more than 2 to 3 centimeters in diameter. "The uterine cornu was resected on the left side, the placenta being left intact with the tubal end." Microscopic examination later corroborated the diagnosis. Convalescence was satisfactory.

A number of cases have been reported in which the uterine stump of a tube which had been previously removed has been resected at a second laparotomy and carefully examined as to its permeability. Ronsse secured three such specimens. In each case, the tubes had been ligated and amputated 1 centimeter from the cornu. On cutting serial sections, he found the tube completely obliterated in each case. According to Ries(16), Gottschalk has had a similar experience. On the other hand Bovée(17), Fränkel, Ries and Rühl have described cases in which salpingectomy was followed some time later by permeability of the tubal stump through the development of tuboperitoneal fistulæ.

*Resection of the Interstitial Canal by Removal of a Wedge-shaped*

*Piece of Uterine Cornu.*—Neumann(18), going a step further, ligated the tubes near the uterine end and excised a wedge-shaped piece of uterine cornu, containing a part of the interstitial canal. He then brought muscle and peritoneum together with catgut sutures and covered over the small raw area remaining with the peripheral portion of the tube. During a Cesarean section, Halban(19) opened the uterus transversely by an incision running across the uterus from one tubal insertion to the other. Before closing the uterus, he excised the interstitial canal and a few centimeters of the tube on each side. Neumann's method, with or without the removal of the entire tube probably offers far more assurance of an effective sterilization than any simple procedure as yet advocated. That its results are infallible, however, cannot be maintained. Küstner(20) has reported two cases of pregnancy following Neumann's method of resection of the interstitial canal. In both cases a vaginal fixation of the uterus had been done, laparotomy being refused, and to prevent further conception, a wedge-shaped piece of uterine cornu was removed on each side together with a small portion of the tube. Both women became pregnant a few years later.

One of the cases reported by Polak two years ago is particularly interesting in this connection. At operation, in May, 1908, a dermoid cyst of the right ovary was removed together with the right tube and a wedge-shaped piece of uterine cornu. In July and August following the menstrual periods were missed. In September, the patient returned with evident signs of internal hemorrhage. The abdomen was opened and a ruptured interstitial pregnancy in the right cornu found. This case, as well as the one from this clinic reported above, are excellent demonstrations of the remarkable manner in which the ovum may sometimes transmigrate from one side of the pelvis to the other.

*Animal Experimentation.*—A large number of observers, notably Fränkel(21), Ronsse, Kehrler, Landau(22), Josephon(23), Ratschinsky(24), Woskressensky(25), McIlroy(26), and many others, have attempted to solve the interesting problem of obtaining a simple, but effectual method of sterilization by experimental work on animals. Fränkel and Ronsse have offered the most thorough works on the subject thus far published, but unfortunately these authors have obtained directly contradictory results. The fact that both of these observers chose the same animal for their work, the rabbit, only adds to the difficulty of explaining their differences. Fränkel, whose work preceded that of Ronsse by a few years, tested out various

methods of obliterating the lumen of the tube and uterine cornu.\* In twenty-six rabbits he completed thirty-three experiments on the tubes and twenty-nine experiments on the uterine cornu. Obliteration of the lumen was attempted by (1) single and double ligatures of rubber, silk, and catgut, (2) simple section, (3) section between two ligatures, (4) resection between two ligatures, (5) resection alone, and (6) resection with cauterization of the cut ends. The tissues were removed at varying intervals and cut in serial sections. Of the thirty-three attempts to obliterate the tube only two were successful and of the twenty-nine experiments on the uterine cornu not a single instance of complete obliteration was found. He concluded that total extirpation of the tube including a part of the uterine cornu and interstitial canal was the only method to be recommended as offering any certainty in its results.

Ronsse, working along the same line, subjected his rabbits to similar procedures: (1) On the uterine cornu, he tried simple ligature with silk and catgut, simple section, section between two ligatures and resection between two ligatures. With perfect regularity, a complete closure of the lumen and hydrometra resulted. (2) On the tubes, he tried single ligatures and section without ligature. He says: "Not only does ligature provoke complete obstruction of the cornu and the tube but simple section is followed by the same result." In a few cases the tube had apparently reunited after resection of a small piece but microscopic examination demonstrated the atresia to be complete. Fränkel and Ronsse each have their supporters and much corroborative work. A satisfactory explanation of their contradictory conclusions must be left to future workers. It must be admitted, however, that the clinic has offered Fränkel far more corroboration than Ronsse.

Until more satisfactory methods have been devised, it would appear that extirpation of the tubes, together with excision of a wedge of uterine cornu, had best be adopted as the only simple procedure offering reasonable assurance of preventing subsequent conception.

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## THE CLASSIC CESAREAN SECTION.\*

BY

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IF by this title we refer to the older meaning of the term, classic Cesarean section opens the abdomen and the uterus, empties the womb, and restores the tissues to their original condition by suture. By many in modern times classic Cesarean section is held to include the operation just described, which is the celiohysterotomy of Harris, hysterectomy after delivery with dropping the stump, and the original Porro operation.

In treating of the older operation, the rapid extension of its indications has greatly widened its scope. Originally intended for contracted pelvis, it is now applied to any condition threatening the life of mother or child where the conditions are less favorable for vaginal delivery. Thus, in well-ordered clinics it is now used for contracted pelvis, physiological incompetence where the labor fails to dilate the birth canal in any appreciable degree, accidental separation of the placenta, placenta previa, eclampsia, pathological conditions of the uterine muscle rendering spontaneous birth impossible, pelvic and abdominal tumors complicating labor, and appendicitis at term. Its low fetal mortality causes it occasionally to be selected in abnormal positions and presentations, although the pelvis may be normal.

The essential point of the operation, as developed by Säger, comprises the accurate and efficient suture of the uterine muscle and uterine peritoneum. This is accomplished differently by different operators, the essential being that the uterine muscle shall heal completely and soundly throughout the extent of the incision. While the majority of operators remove the uterus from the abdominal cavity before incision, it will be our privilege this evening to hear the author of an original method of opening the uterus *in situ* describe his experience.

Those who practise and teach the turning out of the uterus do so because they believe that by this method there is less danger of

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contaminating the abdominal contents by amniotic liquid and the contents of the uterus.

A radical change has come over the profession as to the time for classic section, and it is now found unnecessary to wait the development of labor. In many cases it thus becomes an elective operation. The results of the operation may best be inferred from considerable numbers of cases in well-appointed clinics. Where clean cases are selected, Leopold (*Archiv f. Gynäkologie*, 1910, Band xci, Heft 2) reports sixty-four consecutive sections without maternal or fetal mortality. In a series of 300 sections for various conditions, and with the patients in varying states as regard infection and toxemia, Leopold's clinic reports 300 sections with a maternal mortality of 4.2 per cent. Kouwer (*L'Obstétrique*, January, 1911) has performed sixty sections upon patients in good condition, without mortality. Other large clinics report series of sections corresponding with the statistics given.

While it is unnecessary to multiply figures, statistics abundantly show that in point of maternal mortality the operation compares favorably with vaginal Cesarean section, the high application of forceps, induced labor, version and extraction, and craniotomy. Its fetal mortality is the lowest of any major obstetric operation.

Among the causes of maternal mortality after the classic section is infection, in which it shares a common danger with all surgical procedures; infection, however, arising during operation has been reduced to a minimum, the risk not exceeding 1 per cent.

The classic operation performed upon infected cases is dangerous to the mother, because it leaves an infected uterus. In many cases of mixed infection where the mother is in good condition, and no great violence has been done to the cervix and lower genital tract, the life of the mother and her uterus may be preserved by draining the uterine cavity with 10 per cent. iodoform gauze. In the presence of serious infection the removal of the body of the uterus, preferably by the simple Porro method, is indicated. Experience shows that the immediate dangers of the operation from shock and hemorrhage do not reach serious proportions. Hemorrhage is exceedingly rare where the uterus is properly sutured with reliable suture material. The operation itself does not conduce to shock. Anesthesia in classic section is no more dangerous than in the average major operation.

The secondary dangers following classic section have to do with the uterine and abdominal incision. Where the uterine muscle is adequately sutured, and heals without infection, rupture of the

uterus in subsequent spontaneous parturition does not occur. A considerable number of these accidents are upon record, and the examination of the uterus where such accident has occurred, showed that from improper suturing or infection the uterine muscle failed to unite throughout the greater or lesser portion of the incision. Where the uterine muscle has been replaced by connective and elastic tissue, rupture may follow in subsequent parturition. To obviate this danger, hospital operators abroad are accustomed to advise their patients once delivered by the classic section, to return to hospital for subsequent confinement, although the labor may be spontaneous. Should rupture occur, if it be promptly recognized and treated by section, the maternal and fetal mortality are not great.

In some cases during convalescence, abdominal distention or violent straining from coughing have burst the abdominal incision, causing protrusion of the intestines. This accident happened in the experience of the writer where the patient suffered from severe bronchitis, and where an improperly applied abdominal dressing, after the removal of the stitches—the wound having healed—failed to give adequate support to the recent abdominal scar. The intestine was at once replaced and the patient made an uncomplicated recovery.

This danger is not confined to Cesarean section, but is present after any abdominal section requiring an incision of considerable length.

Adhesion of the uterus to the anterior abdominal wall after the classic section, has been considered a desirable condition and, on the other hand, a dangerous complication. Where it protects the uterus from retroversion, and renders a second operation, if necessary, less formidable, it is a gain for the patient. Where it results in pain through dragging upon the peritoneum, or affords an opening for constricting a prolapsed loop of intestine, it is a disadvantage.

In the writer's experience not more than one-third of the cases develop this adhesion after the operation.

The convalescence after the classic section is no more painful, and often less so, than after other abdominal sections. Lactation is not materially interrupted, and the patient's stay in hospital is not greatly prolonged over the normal puerperal condition.

Although many women believe that the classic section renders them incapable of subsequent spontaneous birth, experience does not bear out this fear, for many patients are subsequently delivered spontaneously, or by a minor operation, such as the low forceps.

The classic section has its most brilliant field where there are especially cogent reasons for preserving fetal life. Schauta (*Journal of Obstetrics and Gynecology of the British Empire*, May, 1909) expresses the view of the majority of operators when he states that in contracted pelvis the classic section has the lowest possible fetal mortality, not excepting spontaneous birth, while its maternal mortality compares favorably with induced labor and breech extraction. The reasons for its low fetal mortality are obvious. It avoids the dangers of unfavorable mechanism, birth pressure, occlusion of the cord, and inspiration pneumonia.

The writer holds no brief for the classic section exclusively. Its success has given us a basis of reasoning which obstetricians are now using in the effort to find better methods; but in pursuing such a study, it may be useful to keep in mind the following points: That classic section obviates the mechanical difficulties and dangers of labor for mother and child; it enables the operator to accurately examine the uterus, pelvic and abdominal organs, and to deal with whatever pathological conditions are then present. When sterilization is desirable, this may readily be accomplished after the classic section by such methods as the circumstances of the case indicate. In doubtful cases, where infection is probable, it permits the local disinfection and drainage of the uterus; in septic cases, it may be followed by the classic Porro operation or extirpation of the uterus. Under all circumstances it gives the fetus the best possible chance for life.

It is my belief that the greatest benefit which can accrue to the medical profession and to the public from such a discussion as this evening's, by a representative special Society, will lie, not in the adoption or rejection of any one method of operating, but in the urging upon the profession and the public the fact that the time has come in the history of medicine when complicated labor must be considered as serious a matter as appendicitis, ectopic pregnancy, and the removal of an abdominal tumor. The multiplication of hospitals has made hospital care available for the majority of parturient women, where such care is necessary. Women are rapidly coming to learn that under unusual conditions confinement in the hospital is safer than confinement at home. The danger in the present situation does not lie from the extension of the operation in the hands of competent operators, but from the indiscriminate performance of section by incompetent and inexperienced men. The general practitioner has supposed that the field of obstetrics is practically his, and when this is invaded by an obstetric surgeon

he is loath to give up what he has considered his own territory. While Cesarean section in emergency has been safely done in private houses by transporting a hospital equipment to the same it should never be performed there when transportation to hospital is possible.

Would it not be well for obstetricians to take essentially the ground recently adopted by the Clinical Congress of Surgeons in New York City, where it was seriously proposed that in graduating medical students some distinction should be made between those who by reason of clinical experience, as assistants or residents, are capable of performing surgical operations, and those who are incompetent because they possess theoretical knowledge only? Personally, for some time I have been in the habit of telling our senior class at Jefferson that those of them who are not willing to serve as assistants after graduation and acquire special training in obstetrics, should be classed as men midwives. They should master thoroughly the treatment of normal labor and the minor obstetric operations, and above all, should learn to recognize the indications for a major operation. When such arise, they should send their patients to a hospital, or summon skilled aid.

The classic section, while apparently a simple surgical procedure, is by no means an easy or simple operation. It requires skilled assistance, aseptic technic, experience and judgment; and its good results are due to the fact that it has been so performed and that its difficulties have been overcome by the general improvement in surgery which has characterized the last fifty years.

Upon another broad line of reasoning, the classic section is an important factor in the modern science of eugenics. The child born without injurious cranial pressure should develop a better brain for education and training than the child permanently injured in prolonged and difficult labor. If we are to uplift the race through the conservation of its young, it is obviously important that the dangers of parturition to the fetus be reduced to the lowest possible point.

250 SOUTH TWENTY-FIRST STREET.



THE ADVANTAGES OF THE SUPRASYPHYSAL EXTRA-  
PERITONEAL CESAREAN SECTION IN CLEAN AS  
WELL AS IN PRESUMABLY INFECTED  
CASES.

BY

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As is well known, it was the desire to escape the high mortality of the classical Cesarean section in cases brought to the operator presumably infected, that led to the revival recently of Ritgen's old idea of extraperitoneal Cesarean section in the inguinal region. But the operation was revived with the modifications of Frank, Bumm, Latzko and others who devised the suprasymphyseal incision of the lower uterine segment and cervix, under the anterior reduplication of the parietal peritoneum. Experience with this operation, at first confined to suspicious cases or those unquestionably infected, was so satisfactory in the hands of many operators that it has resulted in their deliberate selection of this technic in clean uncomplicated uninfected cases. This has been, among others, the writer's experience. The first cases operated on by this method were brought to the hospital after many hours of labor outside, repeated examinations and futile attempts at forceps delivery.

Notwithstanding the awkwardness of carrying out for the first time an unfamiliar technic, and in one case an extensive tear of the peritoneum, the convalescence of these patients was so entirely free from all the ordinary discomforts of an abdominal section that I decided to adopt this method of operating in all cases by preference, with the exception of the exsanguinated patients brought to the hospital with placenta previa in whom a quick, bloodless delivery is of the utmost importance.

My reasons for relinquishing a method to which ample experience during many years had accustomed me, and by which my results had been satisfactory, namely, six deaths in 133 operations, including all kinds, infected and clean, are as follows:

1. The mortality of an extraperitoneal section should be the minimum in both clean and infected cases.
2. The uterine wound is in such a position that even if it should leak or become infected, the result is not necessarily disastrous.

3. There can be no intraperitoneal adhesions afterward with an abnormally high position of the uterus as the least disagreeable consequence.

4. The convalescence of the patient is much more comfortable in every way.

5. The abdominal wound is stronger, less disfiguring, less likely to exhibit a hernia.

6. If the uterine wound should burst in a subsequent pregnancy or labor, the accident is not so dangerous as if the wound were intraperitoneal.

These reasons are so cogent that the extraperitoneal section, it seems to me, must steadily displace the older operation and become the operation of choice in almost all cases. The objections urged against it, which I must confess prejudiced me until experience altered my views, are that it is more difficult than the classical Cesarean section, that it takes more time, that the peritoneum is likely to be torn in the course of the operation, thus nullifying the attempt to make it extraperitoneal, and that if infection occurs, the involvement of the enormous area of pelvic connective tissue and the immediate contiguity of the peritoneum make the infection as dangerous as if it were intraperitoneal.

The first objection is certainly valid, but with a little practice, the operation should present no great difficulties in the hands of a trained abdominal surgeon. The second objection is also well founded; but again, with a little practice, the difference in time between the two operations is not enough to cause any disadvantage to the average patient.

The third criticism, that the peritoneum is likely to be torn, can be met by adopting the proper technic.

The patient should be in a high Trendelenburg position. The skin incision is made transversely above the symphysis and of ample length; the fascia is divided transversely as low as possible; one rectus muscle is partially separated from the pubis; the bladder is partially distended with boracic acid solution; the vesical ligaments are cut if necessary, the bladder displaced to one side and the peritoneum on the lower uterine segment is pulled up as far as possible with a retractor protected by a pad.

If in spite of this technic there is not room enough under the peritoneum to make the uterine incision and to deliver the child, as was the case in three of my operations, the technic of Sellheim is always available, namely, to incise the peritoneum transversely in the fold between the anterior vesical and abdominal walls; and

again transversely in the fold between the bladder and the uterus; by uniting these flaps with a running catgut stitch, ample room is afforded underneath to make the longitudinal incision in the lower uterine segment and cervix and to deliver the child with forceps or with the Sellheim scoop. This part of the operation only takes a minute or two and the rest of it is, strictly speaking, extraperitoneal.

Finally, the statement that infection in the pelvic connective tissue is as dangerous as intraperitoneal infection will not be endorsed by any candid person, and besides, there is a possibility of safe drainage in the pelvic connective tissue that we do not have within the abdominal cavity.

Naturally, extraperitoneal Cesarean section cannot be expected to rob the operation of all danger in infected cases. Statistics would refute this idea if it were entertained, the mortality of the German operators being 6 to 8 per cent., but it will be admitted, I think, by any unprejudiced man, that case for case, this operation should give the patient a better chance than the classical Cesarean section.

I am not, however, arguing so much for the adoption of the extraperitoneal section in infected cases, as for its deliberate selection as the best of operations in clean cases. If a patient comes to me not merely suspicious but indubitably badly infected, I prefer the operation I have done with success in several instances; that is, the delivery of the uterus through a long abdominal incision; scrupulously careful padding off; the evacuation of the womb, its supravaginal amputation; a careful suture of the stump and a suture of the parietal peritoneum around the stump well below the line of suture in it; finally, gauze drainage of the pit formed by the retraction of the stump.

1812 SPRUCE STREET.

CESAREAN SECTION FOR CENTRAL PLACENTA  
PREVIA.\*

## REPORT OF CASES.

BY

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As a preamble to this report I wish to read the words of Lusk written in 1887, and used by Huston Ford(1) in 1892 as an argument for doing what we report to-night. "If it were proposed to a physician to beat out the brains of a new-born infant with the view of diminishing the perils of the puerperal period, the proposition would be rejected as too horrible to entertain, even though the physician were convinced that the theoretical grounds for the recommendation were correct. Yet there is a disposition to treat any hesitation to destroy the unborn child in the maternal interest as a pure sentimentality."

I must confess that I have never felt satisfied with this bit of casuistry and I am sure that, for the bulk of the medical profession, nothing can be more welcome than to learn that there is statistical evidence sufficient to warrant us in a very considerable proportion of cases to decline, equally in the interests of mother and child, to lend our aid or countenance to the sacrificial operations of midwifery.

" \* \* \* \* \* We have many laparotomists operating with brilliant results."

" \* \* \* \* \* They need, however, to open their eyes to the work of our neighbors and to equip themselves for the special field of saving infant life."

In concluding his paper Ford, 1892, advises section for central or partial placenta previa. He, however, reports no cases.

Boyd(2), 1901, read a paper on this subject; his conclusions then recorded are as follows:

"If the hemorrhage appears before the viability of the child; if

\* Read before the meeting of the Obstetrical Society of Philadelphia, November 7, 1912.

the previa is marginal, the cervix dilatable, the fetal heart sounds absent, then version or forceps may suffice.

If, however, the child is viable, the previa complete or partial, the cervix rigid or fetus transverse, then in preference to other interference, section would seem to be indicated."

Zinke(3) of Cincinnati in 1901 reviewing six cases, all then reported, also the papers of Ford, Dudley and Boyd, records these results:

- 4 classical sections
- 2 Porro operations
- 5 mothers lived
- 6 children born alive.

The one mother dying refused operation until repeated hemorrhages made recovery impossible by any method.

At that time he concludes that a 17 per cent. maternal mortality and none for the children gave much ground for a favorable consideration of the operation.

In 1902 Ehrenfest(4) of St. Louis advised against the operation, basing his ideas on these statistics:

"That the mortality of Cesarean section is 30 to 40 per cent. in all cases."

"That in one clinic Olshausen reports 551 cases of section with 19 per cent. mortality and 467 cases of placenta previa with 3.8 per cent. mortality treated by the usual methods, no mention being made of the children."

A review of other literature gives many opinions as to the advisability of this operation.

In the Year-book of Gynecology and Obstetrics covering the German literature of 1911, Cauly makes mention of Cesarean section for central placenta previa.

Many clinics have not as yet tried the operation and are therefore not qualified to speak on its merits.

The résumé in *Progressive Medicine* for 1912 shows the latest report from Zweifel's clinic at Leipsic. In 100 cases of placenta previa, in 5603 labors, only one section was done, this after a bag had been used. The mother and child did well. The opinion of Schweitzer is strongly in favor of section with undilated cervix, no pains and excessive bleeding. One other operator reports three cases with good results.

Jewett in 1909 in a review presented to the American Gynecological Society, collected 2010 cases of placenta previa treated

by methods other than section with a maternal mortality of 10.9 per cent. and fetal of 57.3 per cent., and ninety-five cases treated by abdominal section with a maternal mortality of 11.5 per cent. and fetal of 34 per cent.

At the session of the same Society in 1911 several papers were presented (5).

Cragin reported forty-nine cases treated successfully by bags and did not advise section. Edgar at the same meeting reported forty cases and had not done the operation; in the same discussion Fry believes that central placenta previa under some circumstances may indicate section although he had reported good results by other methods. At that meeting, in discussing the subject, Dr. E. P. Davis related the results of three cases which he had operated on with good results to the mother. One premature child died; one was a monstrosity; one full-term child lived.

I wish to present brief reports of four cases; three of central placenta previa, with one maternal death from excessive hemorrhage and shock, one fetus at six months was not viable; and one case of partial placenta previa in which both mother and child lived, the child dying at five weeks of double pneumonia, perhaps not directly due to the operation.

Of these four cases then three mothers lived and three children lived, the remaining child was not viable.

CASE I.—Mrs. M., primipara; age twenty-eight; white; recently married, was visiting her mother in Philadelphia when nine and one-half lunar months pregnant. She had engaged no medical man in Philadelphia to attend her and when she bled from the vagina profusely at first no one was sent for. When the second hemorrhage not quite so severe occurred at the end of twelve hours, the family medical attendant was notified and immediately sent her to the Presbyterian Maternity.

Examination showed an undilated, unshortened os, no attempt at labor, head of child well above brim of pelvis. The patient was pallid from loss of blood.

Immediate delivery was indicated. The cervical opening was completely covered with placenta. Child alive. It seemed impossible to secure either a living baby or mother by the vaginal route because of the repeated loss of blood, and the unshortened cervix.

Section was proposed and accepted. In delivering the uterus in the usual manner, adhesions were found posterior to the broad ligaments in the pelvis, and the tension upon these adhesions before we could see them split the broad ligament over the enlarged and varicose veins. We delivered the child as usual



and after sewing the uterine wound the ruptured veins were ligated. The patient took ether badly and never reacted from the shock, dying within twelve hours much as some cases of extrauterine die. The uterine cavity was packed with iodoform gauze. The vagina was packed also. There was more than the usual bleeding by the vagina. The baby lived and is doing well.

In talking with the mother of this patient afterward I found that the patient had a year previous to marriage passed through what was then called appendicitis, but which from the description and the findings at operation, must have been pelvic peritonitis of some type.

The first case did not deter me from doing the operation when the next case of this type came under my observation.

CASE II.—July 26, 1912, I saw for Dr. Blackburn a case in the Presbyterian Maternity five and one-half to six months pregnant, bleeding badly. Mrs. H., a multipara who since the birth of her last child had had an amputation of the cervix, repair of the perineum and a removal of the left tube and ovary.

Examination by the vagina disclosed a hard cervix, not dilated, patient not in labor.

The family physician here suggested section. I agreed with the knowledge that there might be some adhesions but it seemed more feasible than tearing through the placenta. The bleeding had quieted down. The patient had been examined four or five times under the proper precautions by the outside doctor and resident.

An incision to the left of the old wound plunged right into an omentum adherent the full length of the first incision, and in the left pelvis it was impossible to deliver the uterus through the omentum, so a portion of the scar and omentum was dissected out. The uterus was delivered, the usual anterior incision made and the child, presenting to the pelvis by breech, delivered by version.

There is a remarkable difference in delivering the placenta through a wound in the uterus which when it contracted allowed me only to use two fingers. After much difficulty the placenta was removed somewhat broken up but without much bleeding. The uterus was packed with iodoform gauze through the incision and the wound closed as usual by buried silk with a peritoneal suture of silk. The patient made a perfect recovery.

CASE III.—The third patient came into the Presbyterian Maternity within one week of this last one. August 1, 1912, Mrs. E., age thirty-three; white. A primipara at about term sent in by Dr. Horan. Last menses October 10, 1911. On examination the outlet admits two fingers but the vagina is very narrow and the undeveloped cervix undilated, no pains; placenta felt fully covering the os. Patient had bled during pregnancy from the slightest vaginal irritation.

On entering hospital, feet, hands and face were edematous and the urine showed a trace of albumin and was of high specific gravity.

Cesarean section by the usual method. Child easily delivered. Placenta found absolutely central filling the pelvis, not easily removed; uterus was packed with iodoform gauze; wounds closed with silk; vagina washed out and packed.

After operation patient became jaundiced but otherwise made an uneventful recovery. She was put in moderate Fowler's position after operation to encourage drainage. The baby nursed and is doing well.

The fourth case does not belong to this distinct class but I shall include a brief history:

CASE IV.—Mrs. E., a primipara about twenty-eight years old, had been admitted to the Jefferson Maternity at about the ninth lunar month of gestation for bleeding without pain; no positive diagnosis could be made; four weeks after admission without labor pains she again began to bleed but not profusely. After bleeding four days, slight labor pains came on with increasing bleeding.

Examination revealed cervix unshortened, admits index-finger, placenta felt apparently covering the os. No membranes to rupture could be found. Examination caused more bleeding.

Section was advised because of the possibility of central placenta previa, the placenta filled pelvis, keeping head of child above brim.

Section in the usual manner showed a partial placenta previa. The mother made a good recovery. The child did not thrive well and at about five weeks died from a double pneumonia, possibly induced by the anemia and malnutrition.

It is to be noted that all but one case in which I have carried out this method were primiparæ and that the condition of the cervix entered largely into the decision for section. However, I believe each individual case must be dealt with as it presents, whether multipara or primipara; whether central, partial, marginal or lateral placenta previa.

It is difficult or perhaps impossible at this date to compile statistics showing the relative mortality of section for central placenta previa and other methods of treatment. Too few cases have been reported and perhaps for some time we must accept individual conviction on such conditions.

Those of us who have our patients in hospital surroundings with few exceptions lean toward operative delivery for several reasons:

The placental site is left absolutely undisturbed. The hem-

orrhage is therefore much less than by any method of vaginal delivery.

The shock of operation is no greater, especially in primiparæ with no attempt at labor. This is a conservative expression. It is perhaps less.

The child is given every chance to live.

The mother, if she recovers, is left in much better physical condition.

The danger of infection in unhandled cases is certainly much less by section and free drainage.

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- 2018 CHESTNUT STREET.

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### THE TREATMENT OF PUERPERAL SEPSIS AT THE SLOANE HOSPITAL FOR WOMEN.\*

BY

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THE conservative plan for the treatment of puerperal sepsis is the plan that has been adopted and in force for many years at the Sloane Hospital for Women. The infection, obtaining its foothold in the raw surface of the endometrium, may be likened to any infection elsewhere in the body. It has the same methods of extension—by contiguity of tissue, by the lymphatics, and by the blood stream—and likewise the same surgical indications for treatment exist as obtain elsewhere.

1. *Surgical drainage* is the first indication. The uterus in the puerperal state is an open wound and drainage is naturally favorable; when lacking for one cause or another it must be freely established. At the same time we consider that in the establishment of such drainage, when necessary by active interference, no inconsiderable amount of damage can be done by trauma to the infected area. Any mechanical disturbance of the infected tissues has the extreme danger of spreading the infection. Any trauma to the

\*Read before the New York Obstetrical Society, December 10, 1912.

septic tissues of the uterus tends to open up new lymphatic channels, to dislodge infected thrombi, and in general to favor extension by disturbing nature's protective processes in the wall of the uterus. Therefore, the establishment of drainage must be effected with a minimum of trauma.

2. The second indication is to make sure that the *uterus is empty*, both as regards fetal products and blood clots, for such material in the presence of pathogenic organisms favors a rapid proliferation of the organisms and increases the virulence of the septic process. This indication is intimately associated with the establishment of drainage, and yet as any attempt to explore the uterus is necessarily accompanied by considerable trauma, in every case we consider that the uterus is empty of foreign products until the first measures for obtaining drainage have proved ineffectual.

(It should be stated here that until recently all cases treated at the Sloane have been delivered in the hospital, no postpartum cases being received. Many cases are admitted after having been in labor outside the hospital, sometimes with active interference on the part of the family physician, and are then brought to the hospital because of failure to deliver for one cause or another. So until recently we have been assured that the uterus was fairly empty of fetal products because it was emptied in our own delivery room. Our working rules demand that before a patient leaves the delivery table the placenta and membranes shall be thoroughly examined, and if at all incomplete, barring possibly small shreds of chorion, complete removal must be effected by a manual curetage. Hence the assumption that the uterus is empty and the reticence in giving up that assumption and exploring the uterus.)

3. The third indication, as elsewhere, is the *treatment of secondary foci* as they arise, and here conservatism is also followed. We wait as long as possible for their encapsulation and walling off before disturbing them, and then if necessary to interfere, confine our interference to simple incision and drainage, with as little trauma as possible.

4. The fourth indication is to consider the *general systemic, hygienic, and dietetic treatment* as in any illness.

*A Concrete Case receives Treatment as follows.*—At the outset, with the first rise of temperature, one never knows with what one has to deal. The great majority of cases with rise of temperature are not septic, but the future course is all that will tell. Acting on the theory of chances, the case is at first regarded as a sapremia, a simple failure of lochial drainage, with consequent saprophytic decomposition and absorption. A hot saline vaginal douche is given, and at the same time an ice-bag is applied to the fundus if there is any

local pain or tenderness. The vaginal douche is repeated every twelve hours and usually suffices if the symptoms are caused by simple retention.

The exact method by which the vaginal douche accomplishes results is still undetermined, but besides cleansing the vagina of any retained discharges, it seems to have a relaxing effect upon the muscular fibers of the cervix, particularly at the internal os, at the same time that it stimulates the fibers of the body of the uterus to contraction. In this way drainage is effected. In this connection it may be said that ergot is not given when there is a suspicion of failure of drainage. If the patient is receiving ergot when retention develops, its use is discontinued. This is in direct opposition to the custom of many authorities, but it has seemed to us that ergot causes as marked contraction of the fibers of the cervix as of the uterine body, and therefore hinders free drainage. Whatever its exact action, our cases seem to do better without it when there is retention with a rise in temperature.

If, despite the vaginal douches, the temperature persists for twenty-four hours or more (and by temperature we mean a mouth registration of 100.6 or over, an arbitrary standard) the inside of the uterus is washed out with hot sterile saline solution. The intra-uterine douche is given without anesthesia, under the strictest aseptic precautions. After thorough vulvar, vaginal, and cervical preparation, a culture of the uterus is taken, and then the douche tip is inserted directly by sight through the cervix up into the uterus. The douche tip, glass for the first nine to ten days, a smaller metallic one for later periods, according to the size of the uterus, is gently inserted into the uterus and with the very slightest movement of the tip, the flow is continued until the return is clear. The usual amount given is 3 to 4 quarts. No mechanical drainage is employed, and the patient is returned to bed. The next regular twelve-hour vaginal douche is omitted, to be resumed at the next succeeding twelve-hour period.

In most cases the temperature will fall as the retained lochia is brought out with the intrauterine douche. We have found that in over 90 per cent. of our postpartum temperatures this is all that need be done locally, that the symptoms subside, the temperature falls and remains down, and that we have been dealing with a simple retention, a sapremia, cured by efficient drainage.

In a case of sepsis, however, the result is not so favorable. The temperature does not fall, other septic symptoms supervene, and it is now that we make sure that the uterus is empty. If, despite the

vaginal and intrauterine douches, the fever remains as high or higher, with or without the development of other septic manifestations, the interior of the uterus is explored. In exploring the uterus anesthesia is ordinarily employed, and a digital curetage done. No curets are used, although sometimes a sponge-stick is utilized to remove pieces of tissue loosened by the finger. As far as possible all foreign material is removed, always with the idea of the minimum of trauma, and a hot saline douche given. No packing or other drainage is used unless hemorrhage occurs, when a strip of packing, either plain, bismuth, or iodoform, usually bismuth, is inserted, to be removed at the end of twelve to twenty-four hours. It should be said that if a postpartum septic case is admitted to the hospital, this exploration takes place at once, and in a similar manner as in cases delivered in the hospital, without waiting for the effect of the vaginal and intrauterine douches.

The future local treatment depends upon two factors, the temperature and the amount of uterine drainage as shown by the intrauterine douche. If the temperature falls, well and good, the vaginal douches suffice. If the temperature persists as high or higher than before the exploration, the intrauterine douche is repeated at the end of twenty-four hours, as in the first instance. Daily intrauterine douches of saline are given as long as the temperature persists *and* there is any appreciable return in the douche; in a manner of speaking, as long as we obtain enough from the interior of the uterus to pay us for our trouble. When we fail to obtain return in the intrauterine, the douches are discontinued regardless of the temperature, and conversely, no matter what the return, they are not given if the temperature is down.

This is the extent of our uterine interference in any case, and as may be seen, is conservative. Likewise, extension of the septic process into the parametrium, broad ligaments, tubes, etc., is similarly treated. The development of any pelvic induration or abscess is carefully watched. Vaginal examinations are minimized. Active interference is put off until the last possible moment, waiting for nature's walling-off process and softening, and then contenting ourselves with simple incision and drainage. This is made according to the anatomical localization, but is made through the vagina whenever possible. Abdominal incisions are made as a last resort to attack masses not to be reached from below, and in these cases, through-and-through drainage is invariably employed. No matter how septic the patient, operative procedures are not considered unless there is a distinct surgical indication in the nature of



a more or less localized mass, surgically ready to open and drain. Although we have not employed it, we are not in favor of the radical operative treatment of puerperal sepsis, as the conservative plan thus outlined seems more rational and has given as good or better results in our hands than the radical has at the hands of its advocates.

General and supportive treatment is, as a matter of course, instituted. The patient is isolated. Nursing is stopped when sepsis is assured. The head of the bed is elevated, ice is applied continuously to the abdomen, and the diet, necessarily light, is made as nourishing and nutritous as possible. Fresh air is a great help, and we have had good results from the continuous out-door treatment on the roof.

Vaccines and sera have not proved of much benefit in our experience. We have not used them as routine until recently, but have used them in many cases and, in our mind, any marked benefit is doubtful. Both autogenous and heterogenous varieties have been used. Lately we have begun the routine use of an antistreptococcus serum produced by the local Department of Health, but while we cannot report any marked favorable result, our number of cases with its use is still too small to arrive at any definite conclusion.

*Results.*—In taking up a statistical study of results obtained, a difficulty is at once encountered. What is a sepsis? Where does a marked sapremia end and a mild sepsis begin? The clinical course is one's only guide, and at the Sloane an arbitrary course is followed. Any uterine temperature lasting over a week is called puerperal infection, while those of less than a week's course are classed under sapremia. Of course this does not include rapid severe fulminating cases of sepsis lasting less than a week, where the differentiation is simple. This is unsatisfactory in many ways, but is the classification adopted, and the following statistics are based upon that division.

In the last 8,000 deliveries at the Sloane, there have been thirty-nine cases of puerperal sepsis, according to this classification, 0.485 per cent. Of these thirty-nine cases, thirty-three had no interference postpartum except simple vaginal and intrauterine douches.

There were four digital explorations on four patients. In two cases this was sufficient, while in the other two extension into the parametrium took place requiring later posterior vaginal sections. In the first of these latter two, the single colpotomy with drainage was sufficient, while in the other new local abscesses developed and required further incision and drainage. In this last case there were in all three vaginal sections done, and finally a laparotomy was

necessary; through-and-through drainage was instituted with the result of controlling and clearing up the process.

In one other case, delivered by Cesarean section, there was a breaking down of both abdominal and uterine wounds, and through-and-through drainage was instituted after the wounds had opened up as a result of the infection. This was done at one of the daily dressings, without anesthesia.

The only other operative procedure was the opening by laparotomy of an intramural abscess of the uterus and draining by vagina as well as from above. So that under our plan of treatment in the last thirtynine cases of puerperal sepsis, the operative measures were:

Digital curetage.....	4 in 4 patients.
Posterior vaginal section	5 in 3 patients.
	2 of whom had had curetages.
Laparotomy.....	2 in 2 patients.
	1 had had curetage and posterior vaginal sections (3).
	1 had intramural abscess of uterus.

One through-and-through drainage in an infected Cesarean section, the wounds already opened by the infection.

Of these thirty-nine cases, eleven died, a mortality of 28.2 per cent. However, two cases hardly belong, as one died of pulmonary embolism after being up and about, convalescent, after a mild infection of a few days duration, and the other, admitted in the eighth month of pregnancy, with a red blood cell count of 1,100,000, with all the characteristic blood changes of a true primary pernicious anemia, died of exhaustion and anemia a few days postpartum, although there probably was an element of infection in her case. All the remaining cases made good recoveries.

This death rate corresponds closely to the rate for the entire series of 28,000 cases delivered at the Sloane, this being 24.76 per cent. The last 8,000 cases, covering a period of nearly five years, have been taken as representing the more recent results of treatment, fairly constant as regards supervision, methods of treatment, and operators. This rate is high, too high, but as low as we have been able to bring it, and we think as low as the more radical methods of treatment would have shown in the same series of cases.

The causes of death in the eleven cases were,

General septic peritonitis.....	5 cases.
Pyemia and exhaustion.....	4 cases.
Pernicious anemia.....	1 case.
Pulmonary embolism.....	1 case.

In all these cases save the last two, where the sepsis was slight, there was a true bacteremia yet with no localized foci capable of being attacked by surgery. So none of the fatal cases had any of the operative measures detailed above, with the one exception of

the through-and-through drainage employed in the case of infected Cesarean section.

As yet nothing has been said about prophylaxis. It has been left until this point in order to emphasize what statistics show us. No one of us doubts but that in no other sphere of medicine or surgery is prevention so much better than cure. This means that every safeguard as regards asepsis and sterility must be enforced. In this respect the figures are instructive. Not only are the obstetricians attached to our hospitals, but also physicians in general practice becoming more careful in the handling and examination of the woman during pregnancy and in labor. The first 20,000 cases at the Sloane show a total of 215 cases of sepsis, 1.075 per cent., while the percentage for the last 8,000 cases is but 0.485, considerably less than half. Surely this can mean nothing but that modern aseptic measures have their results. The mere introduction, some years ago, of the routine use of rubber gloves for all examinations and deliveries brought down the sepsis rate at the Sloane over 20 per cent. at once.

One further point in the prophylaxis is most striking, a point emphasized so much in the past few years by many observers; that is the high percentage of sepsis in cases where Cesarean section is done after vaginal examinations and manipulations. Six of our thirty-nine cases were of this type, and in every case the infection was severe, with the loss of four patients. The temptation to do a Cesarean section after vaginal interference is great in many cases, but the risk is correspondingly great, and conservatism cannot be urged too strongly.

*Recapitulation as to the Methods of Treatment of Puerperal Sepsis as employed at the Sloane Hospital for Women.*—1. *Prophylactic Treatment.* Use extreme care as to surgical asepsis, limiting as far as possible all antepartum, intrapartum, and post-partum examinations, interference, and instrumentation, resorting to them only when clearly indicated.

2. *Active Treatment.*—A. Obtain adequate uterine drainage, first, by simple vaginal and intrauterine saline douches. This proving insufficient to control the process, explore the uterus once, and once only, to make sure that it is empty of foreign products, using the finger for the exploration, and with a minimum of trauma to the uterine tissues.

B. Treat expectantly secondary foci as they arise, and

C. Support the general condition of the patient.

## A REPORT OF CASES OF HYDATIDIFORM MOLE FROM THE SERVICE OF THE UNIVERSITY MATERNITY.

BY

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(With Three Illustrations.)

THE following cases are reported in view of the fact that each possesses some interesting complication.

**CASE I.**—E. W., iii-para, age twenty-six. Admitted to the hospital May 31, 1908. Previous medical and social history negative. Menstrual history normal. No miscarriages, last child born 1904. Patient menstruated last on February 2, 1908.

*History.*—Four days before admission patient began to bleed from the vagina, had slight pains in the back, and at this time noticed an abdominal enlargement.

*Physical Examination.*—Uterus as large as in a four months' pregnancy. To the right of the uterus and behind it was a mass freely movable.

*Diagnosis.*—Ovarian cyst.

*Operation.*—June 3, 1908. Laparotomy. A cystic right ovary removed. The left ovary slightly cystic, was not removed. Abdominal wall sutured in layers. The day after operation the vagina was found filled with blood clots, the cervix soft. The cervix was packed, a short time later the packing and about a liter of vesicles expelled. Convalescence normal and patient discharged June 16, 1908.

Pathological report by Dr. Allen J. Smith: The gross specimen is a polycystic ovary measuring 5.5 centimeters laterally, 4 centimeters anteroposteriorly, and 4.5 centimeters perpendicularly. Lobulated outline, pale smooth surfaces. On section the organ is riddled with cysts varying in size from minute cavities to about 1 centimeter in diameter, mostly filled with a thin viscid fluid. Several small ones have a distinct yellowish-brown lining. One of these is included in the section and the remaining tissue of the ovary is soft, pale and gelatinous in consistency. Section taken from the upper part of the ovary avoiding the large cysts and keeping as much as possible in the soft fleshy part of the structure. Microscopically, none of the surface "germinal epithelium" is retained. The portion of tunica albuginea upon the section is dense but not appreciably thickened. In the section there is just beneath this layer a small amount of relatively unchanged ovarian tissue in which a few follicles are persistent but for the most part the stroma of the

section is a loose fibrillar one, more or less infiltrated with cells and at places by a small amount of red blood corpuscles. One small lutein cyst has the usual large cell lining in numerous strata. Widely distributed throughout the stroma both as isolated cells and in varying sized groups are large numbers of granular lutein cells. Some are necrotic, others in excellent state of preservation. Plasma cells, a few leukocytes and fibroblastic cells are mingled with them to make up the cellular distribution in the matrix. A few small corpora fibrosa complete the picture. There is evidently an excess of lutein tissue in the specimen bearing on the hydatidiform mole in the same case.

The mole showed the typical formation with a suggestion of decidualomatous changes.

*Diagnosis.*—Cystic ovary, excess of lutein tissue, hydatidiform mole with suggestion of deciduoma.

CASE II.—L. N., o-para, married, age twenty-two. Admitted to the hospital July 20, 1912. Previous medical history negative. Menstrual history normal, last menstruation May 1, 1912. Shortly after this the patient was nauseated and vomiting began, which became so severe as to keep patient in bed.

*Physical Examination.*—Uterus, the size of a five months pregnancy. There were found two tumors, one freely movable in the right side of the lower abdomen, the other lodged behind the uterus. Each about the size of a small lemon.

*Diagnosis.*—Bilateral ovarian cysts, hydatidiform mole.

*Operation.*—July 24, 1912. Laparotomy. Both ovaries cystic; the uterus opened and a mole protruded. Supracervical amputation of the uterus and removal of both adnexa. Abdominal wall sutured in layers. Patient discharged in good condition on August 14, 1912.

Pathological report by Dr. Allen J. Smith, as follows: Both ovaries are much enlarged and polycystic. The right one measures  $9.5 \times 6 \times 5$  centimeters, the left  $8 \times 5 \times 4$  centimeters. The serous surfaces are boccillated from the projection of small cysts, smooth and shining. A section of one is occupied with a perfect honeycomb of cysts, some containing fluid, some a firm, gelatinous, brown-colored material, resembling colloid, others a material looking like dirty white of egg after boiling. Sections of the ovary show the tissue thickly beset with the cysts above referred to, these cysts vary in size from minute ones up to a cavity of 1 to 2 centimeters in diameter. The darker, firm jelly stains pink with cosin and is thickly beset with blood pigment granules and at places blood corpuscles can still be made out so that there has been an admixture of hemorrhage with what was probably pseudomucin. Plain pseudomucinous material can be recognized in others, and in those not completely empty there is often found a fine reticulum of fibrin-like mesh, a material which presumably is fibrinous in character. The lining of the cysts varies considerably.

In these which show the pseudomucin, and hemorrhagic

material for the most part, a thin, double or treble layer of thin, low, cuboidal epithelial cells lines the space although in many instances this has evidently undergone an atrophy. In those with the liquid contents, and especially where there is a fibrin network retained, the lining cells are not sharply demarcated from the stroma of the ovary, and seems to have developed in connection with it. They are not as large as the lutein cells nor as granular, they are, however, not incompatible with a

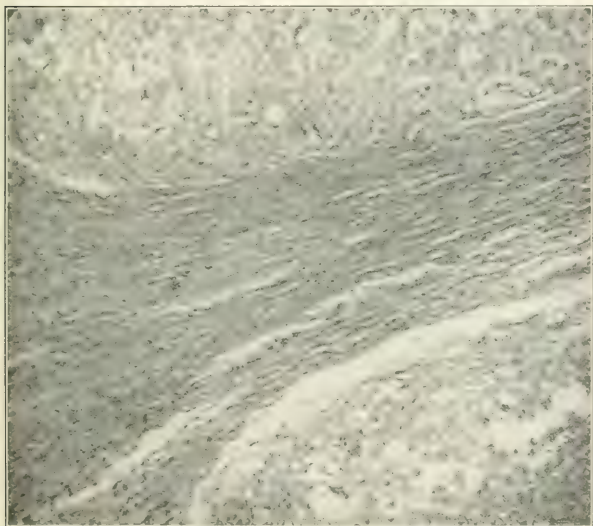


FIG. 1.—Photomicrograph of ovary of Case I showing section of diffusion of lutein cells through the stroma.

cell of this type without great activity in the development of its lipoids. The stroma varies in its consistency. Between some cysts a dense fibrous tissue, again a loose fibrillar structure, and in other places the ordinary spindle-shape type of normal ovarian stroma.

Sections of the myometrium show the inner layer corresponding to the endometrium, necrotic to a depth of 5 millimeters, and sharply demarcated from the deeper structure by a zone of dense leucocytic infiltration. In the deeper layer apparently there is some decidual tissue but no recognizable endometrium. The muscle substance, apart from the enlargement of the fibers and the infiltration with leucocytes may be regarded as normal.



No chorionic or syncytial elements were found in the sections examined.

Sections of the mole show the typical formation.

*Diagnosis.*—Polycystic ovaries, hydatidiform mole, normal myometrium, subinvolved uterus.

CASE III.—O. T., i-para, Married, age twenty-seven. Admitted to the hospital July 23, 1912. Menstrual history uncertain. For one week preceding admission she has had irregular bleeding from the vagina and cramp-like pains in the lower abdomen. Frequent nausea.

*Physical Examination.*—Uterus, fundus just above umbilicus. Cervix soft and easily admitted two fingers. No fetal parts palpable.

*Diagnosis.*—Hydatidiform mole.

*Operation.*—July 25, 1912. Cervix dilated and uterus cureted. A large quantity of vesicles removed. Ether anesthesia. The day after the operation the patient became gradually drowsy and a progressive jaundice developed. The temperature, pulse and respiration rate increased, coma set in and death occurred within twenty-four hours. A diagnosis of acute hepatic degeneration was made. Autopsy refused.

CASE IV.—M. C., multipara, Married, age about thirty. Admitted to hospital on August 3, 1912. This patient, a Greek woman, was referred from the out-patient service with a history of being several months pregnant, and having suffered for some days with a bloody vaginal discharge.

*Physical Examination.*—Uterus extended halfway to the umbilicus. Vaginal discoloration present. Cervix soft.

*Operation.*—August 7, 1912. Cervix dilated and the uterus cureted under ether anesthesia. During the operation patient had a profuse pulmonary hemorrhage, and died in a few minutes. About a pint of vesicles had been removed when the hemorrhage took place. Autopsy refused. Pathological report on the specimen showed a typical mole formation.

Cystic degeneration of the ovaries occurring in connection with hydatidiform moles, has been noted as far back as 1840 and in recent years it is met with in an increasing frequency. Findley(1) in 1903 in a collected series of 210 cases found cystic ovaries noted in eight. Runge(2) in 1903 in a series of 172 cases of hydatidiform moles and chorionepitheliomas found cystic degeneration of the ovaries present in thirty-six cases, while Frankel(3) in 1910 found nearly 100 cases.

A definite histological identity has been demonstrated for these cysts by Lockyer.(4) He describes in detail the histology of the ovaries of six such cases, and states that he has not met with a similar condition in ovaries not associated with either hydatidiform moles or chorionepitheliomas. He bases his

recognition on the arrangement of the lutein cells in the cyst walls, and in the ovarian stroma. The microscopical appearance of the ovary in Case I coincides with his descriptions. In Case II the proliferation of the lutein cells in the stroma is not present, nor are the cells in the cyst walls entirely typical of lutein tissue, the general description of the ovaries, however, closely approximates those which Lockyer examined. In discussing this condition Blacker(5) says that in normal pregnancy there is no atypical proliferation of the trophoblast and consequently no need for excessive proliferation of the lutein tissue.

The fact that no metastases of the cysts or of the lutein tissue has been noted would declare against their malignancy. Lockyer states that there has been noted no dissemination by either the blood or lymph streams, and that the distribution of the lutein cells in the stroma was due to a passive displacement.

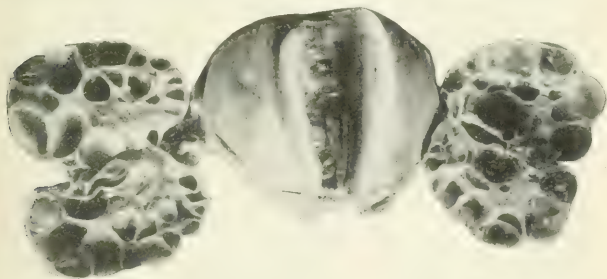


FIG. 2.—Photograph of ovaries and uterus from Case II showing the cystic character of the ovaries. The mole has been removed from the uterus.

The question naturally arises as to whether the cysts are primary or secondary to the mole formation. In most cases the cysts have been found present at the time of operation. In one case the ovarian cysts caused dystocia in a normal pregnancy and the succeeding pregnancy was a mole formation.(6) In another case the adnexa were normal at the time of operation, during the puerperium the ovaries became cystic but the enlargement disappeared later on.(7)

Blacker believes both conditions, mole and lutein cysts, to be due to the same cause, a simultaneous degeneration occurring in both structures.

In view of the recent work on the serum diagnosis of pregnancy in the early months(8) the view might be held that some

change in the blood of a biochemical nature was responsible for these associated conditions. Vesicular degeneration of the chorion has recently been ascribed to an alteration or lesion of the fetal blood-vessels, of a toxic or infectious nature(9)(10). This toxic substance first affecting the chorionic vessels might through some product of degeneration of the excessively pro-

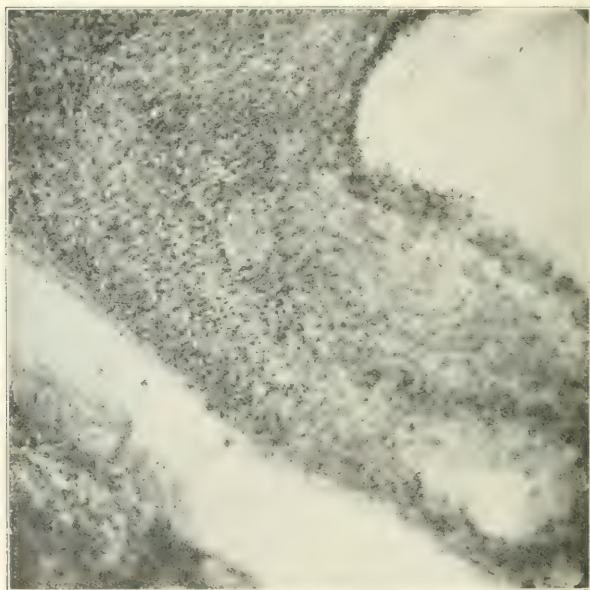


FIG. 3.—Photomicrograph of section of lining wall of a cyst from ovary of Case II showing a few atypical lutein cells and a practically normal ovarian stroma.

liferating trophoblast afford the necessary stimulus for a reaction in the lutein cells.

Livadas(11) says that the theory is now admitted that vesicular degeneration of the chorion may depend on a primitive malformation of the ovule from a diseased cystic ovary. According to Marchand(12) the maternal impression upon the ovum while still in the ovary is strong enough to influence the latter to trans-

mit any of the peculiarities it may have to the developing ovum, and these tendencies to disease may show themselves during the development of the ovum in the uterus. He adds, however, that it is hard to say whether an ovum in an ovary undergoing cystic degeneration can give rise to a hydatidiform mole.

The theory that the presence of the cysts interferes with the normal function of the corpus luteum, as expressed by Fränkel (13) and others, is held by various authors, but in different ways. According to Fränkel the vesicular degeneration is due to a lack of lutein tissue, Pick(14) thinks it is due to an excess of secretion, while Jaffé(15) thinks the overproduction of lutein tissue as found in the stroma rather than the mere fact of cyst formation is the etiological factor.

As regards experimental work on this subject nothing definite has been reported(16). The ingestion by animals in early pregnancy of large amounts of lutein tissue or their injection with an extract might possibly throw some light on this question.

An interesting clinical fact recently noted has been the retrogression of the cysts after the mole was removed(17)(18). In these cases, the cysts, usually noticed at the time of operation have been seen to disappear gradually, the time varying from a few weeks to several months. In view of this fact Goulloud would have them called "tumefaction cysts." The fluid may be simply a transudate, an overproduction of the liquor folliculi, and be reabsorbed, as happens in some simple cystic ovaries.

Cystic ovaries of a size usually noted in association with hydatidiform moles are usually either removed or subjected to a conservative operation. In view of this now frequently noted retrogression, an expectant treatment would seem to be indicated. Unless some complication as suppuration, twisting of the pedicle(19), or progressive enlargement(20), arose, the cysts may be left to take care of themselves under careful observation. As mole pregnancies have been followed by normal pregnancies it is to be supposed that such ovaries having undergone retrogression, would recover their power of producing ova capable of fecundation and normal development.

Case II has afforded an opportunity to study, if present, the degree of penetration of the decidua and myometrium by the proliferating trophoblast. According to Leith(21), in 66 per cent. of cases of hydatidiform mole the penetration is so slight as to permit a complete evacuation of the uterus. In 30 per

cent. however, there is a deeper local erosion so that neither the spontaneous expulsion nor artificial evacuation of the uterus can entirely rid the uterus of all the invading fetal cells. The degree of malignancy and of excessive invasion cannot be accurately determined by a microscopic examination of the mole alone. The fetal cells left behind in the endometrium or uterine muscle may, or may not recur or go on to the formation of chorion-epithelioma, local or with metastases. The decidua is usually destroyed by compression atrophy and as a rule no trace of the fetus or amniotic cavity is found. In Case II the sections of the myometrium examined show no chorionic or syncytial elements. Decidual tissue was present. So it is apparent that in this case the resisting power of the decidua prevented any invasion of the uterine muscle by fetal cells.

In many of the cases reported mention is made of the appearance of symptoms of the toxemias of pregnancy. Thus nausea was present in 50 per cent., exaggerated vomiting in 30 per cent., marked edema in 26 per cent., and albuminuria in 30 per cent., in a recently reported series. Convulsive seizures with mole formation have been noted(22). Rossi-Doria(23) state that in 310 recorded cases symptoms showing autointoxications have been present in 182. In 50 per cent., the manifestations were so severe as to lead to the emptying of the uterus, although the diagnosis of mole had been made in only a few cases. Hergott(24) reports a case of twin pregnancy with mole formation in which death followed fifteen days after delivery. The puerperium was characterized by a febrile condition and extreme jaundice developed. Autopsy showed marked softening of the liver, while the spleen and other abdominal organs were normal. The adnexa showed no changes. Although Case III did not come to autopsy, the symptoms and manner of death point to the hepatic type of toxemia of pregnancy which now has a recognized pathological identity. This case may be offered in substantiation of the theory that the toxemias of early pregnancy are caused by the overproduction or excessive elimination of toxic substances from the fetal elements, which were in this case in a definitely hypertrophied condition.

In Case IV the fatal hemorrhage, which occurred during the course of the operation, may have been due to some unrecognized pulmonary tubercular process, or to an ulcerative process elsewhere. No similar cause of death was noted in recorded cases.

## SUMMARY.

In this series of four cases, two women had previously normal pregnancies; in the other two it was the first pregnancy. The ages varied, as follows: twenty-two, twenty-six, twenty-seven, thirty years.

Bleeding was a prominent symptom in three cases, abdominal pain in two, nausea in two, and severe vomiting was present in one case. The enlargement of the uterus as compared with that of normal pregnancy for a similar period of amenorrhea was in one case, twice the size to be expected, in a second case it was only slightly greater. The difference from normal in the two remaining cases could not be determined on account of the obscure menstrual histories they presented.

Cystic degeneration of the ovaries was present in two cases. In one there was a definite lutein cell proliferation, in the second an atypical lutein cell formation of the lining wall of the cysts.

In the treatment of these cases one was subjected to a pan-hysterectomy, another had a cystic ovary removed by a laparotomy, the mole in this case was expelled spontaneously after packing the cervix. In the two remaining cases the treatment was dilatation of the cervix and curetage of the uterine cavity.

Death occurred twice, in the first case from acute hepatic degeneration, and in the second instance from a hemorrhage, supposed to have been from a pulmonary tubercular process.

In conclusion, I would acknowledge my indebtedness to Dr. B. C. Hirst for the privileges of using these case histories, and to Dr. Allen J. Smith for the photomicrographs.

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## TANS ACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRI- CIANS AND GYNECOLOGISTS.

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### WHY INCIDENTAL REMOVAL OF VERMIFORM APPENDIX, WHEN REASONABLY POSSIBLE, SHOULD BE THE RULE.<sup>1</sup>

BY

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THIS procedure has been practised more or less by a large number of surgeons for a number of years—chiefly by those who do the most work. Still there remain many others who object to it on sentimental and theoretical grounds, that, in some instances appear as rather shabby excuses.

It is time that such men be made to feel that this quibbling will not be accepted in lieu of what is accepted as a matter of duty by those who do probably the most and the best abdominal surgery. For this reason there should be a more general expression on the subject.

Prophylaxis is becoming more and more the better part of the function of every medical man. All researches aim in that direction by leading to a better understanding of physiological facts and processes and by finding out the causes of disease, for the general public good. The medical profession is the one which, above all other learned callings, is zealously engaged in altruistic labors which gradually diminish the sources of its revenue and the reasons for its existence. It is a noble thing to rescue life and health from their battles with disease, injuries and infirmities; but it is a nobler thing to guard them from such attacks.

As far as is now known or likely to be known, *the vermiform appendix is a vestigeal structure, not to be regarded as an organ or*

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*in any sense essential to the body.* This is evident from its embryological history and is abundantly proven by thousands of observers in thousands of cases. Who, of all these witnesses, ever saw any harm from the loss, *per se*, of this little reptile, so common in the genus homo, no matter how abundant be his theories in its defence. Embryologists, notably Prof. F. P. Mall and Mr. Max Broedel, who carefully examined fifty-four human embryos and presented enlarged illustrations of many of them, state, that between the fourth and fifth intrauterine week the cecum first appears as a bud upon the caudal limb of the original loop of intestine within the umbilical cord. At the eighth week it has become differentiated in size from the small intestine, which has grown rapidly in length. At this time the primitive cecum begins to reject its terminal portion by a restriction in the growth which continues until the variable vestige remains which we call the appendix. A structure thus discarded in nutrition and function lacks that vitality, hardihood and capacity to ward off disease, which other organs have that render an essential service. An organ that does this, as Horsely says, will not be found to vary so extremely in size, shape, consistency, position and blood supply. Exhaustive histological and other studies of the appendix have been made by Ribbert,(2) Zuckerkandel,(3) Suduski,(4) Riedel,(5) Meisel,(6) Lanz,(7) Brunn,(8) L. Aschoff,(9) Faber,(10) MacCarty,(11) and Nowicki(12).

Those of us who have not the time or opportunity to make such commendable studies of this subject should at least acquaint ourselves thoroughly with these researches already made in it, for they bring daylight to the whole subject. When we have done this, we are made to realize that almost daily, appendices have passed through our hands that we have regarded as "normal" or "innocent" or "atrophic," etc., when 50 per cent. of them would be found to contain or harbor dangerous beginnings of disease (Aschoff,(13) Pankow), and at least half of the remainder would show interesting evidences of chronic processes if we were to examine them properly macroscopically and microscopically. Aschoff says only half of all adults attain the age of forty years and retain a normal appendix. MacCarty says "there are very few entirely normal appendices." Hermes found the appendix diseased fifty-three times in seventy-five gynecological operations; and Kroenig found it so twenty-one times in twenty-eight such operations in which it was incidentally removed. Goedecke(14) observed sixteen women during preg-

nancy, who had each had repeated attacks of appendicitis previously. Only five of them escaped, while eleven had appendicitis during their pregnancy. The dangers of this complication are such, that no woman who has had repeated attacks of real or apparent appendicitis should be permitted to become pregnant until such an appendix has been removed. To prevent conception in these cases is certainly our duty, as it is ever our duty to induce abortion in those cases who are tubercular.

*The appendix is the locus minoris resistentiæ of the entire intestinal tract, if not of the entire alimentary canal.* Stoeber and Dahl,(15) Kretz, Sahli, Aschoff, Corner, and Nowicki call attention to the disproportionate amount of lymphoid tissue and nodes chiefly in the submucosa of the appendix, at the expense of the muscularis mucosæ, so that the epithelium comes in contact with the lymph tissue beneath and provides a direct route for infection from the lumen of the tube to its submucosa where the primary foci of infection may be very marked, before any change is noticeable in either the mucosa or serosa. For this reason most of the authors named have likened the appendix to the tonsil; and the Frenchmen Letulle, Pilliet, and Corte have similarly emphasized the lymph nodes in the submucosa as the initial points of infection. Some desperate theorists point to this abundance of lymphatic elements in the appendix as a safeguard, to take care of the overflow of dangerous elements from the cecum. To make such an idea rational, this tissue should be placed, along with much more of it, in the submucosa of the cecum itself, and not be tucked away in a structure whose trophic conditions are subnormal and whose lumen connects by means of a dangerously small opening with the intestinal tract at a point where the bacterial flora of the latter are most abundant and dangerous. Such a combination may be viewed as a bomb rather than to be credited with any physiological merits. That this picture is not overdrawn, is evident from the sudden, severe and disastrous course so often observed in cases of acute appendicitis, leading in a day or two to gangrene or to perforation and extended peritonitis no less serious than those which obtain in cases of strangulated hernia. To be thus overtaken by either of these freaks of human infirmity spells disaster. Why then await the eruption of such disaster in the one case more than in the other?

To prove the liability of the appendix to infection by way of the blood current, Stoeber and Dahl injected cultures of pneumococcus into the neck of a considerable number of guinea-pigs,

near the tonsils, repeating the injections from eight to fourteen times on as many successive days, and then killed the animals when they did not die from the infection. At postmortem, the tonsils and lymph glands of the neck were always greatly enlarged. The general intestinal canal, however, showed some engorgement of its lymph structures in two of the animals only; but the appendix showed marked hemorrhagic engorgement of the lymph structures beneath its mucosa in every animal and necrotic portions in some of them, thus proving not only the manner of infection, but also that the appendix is the one point of least resistance in the intestinal tract.

During the past ten years the appendix has been removed incidentally with constantly increasing frequency; and greater interest in its capacity for evil has led to more frequent microscopic examination of it. This has shown that carcinoma occurs in about one-half of 1 per cent. of all such appendices and is discoverable only with the microscope in most of them. A large number of observers mention isolated cases. McWilliams(16) collected 105 cases, and MacCarty and McGrath(17) recently reported twenty-two as found in 5000 appendices examined. They say they occur in very small nodules of a lemon yellow color, chiefly in the submucosa and mucosa and that in seventeen of their cases, nothing could be seen or felt except a very small yellow spot in the serosa of one of them which must be carefully distinguished from fat similarly located in inflamed appendices. Some pathologists have hesitated to ascribe serious malignancy to these growths, because certain features of this are lacking, and because metastases have usually not been observed. But what Kelly has correctly stated appears to be accepted, namely, that these growths lead to early perforation or an attack of appendicitis which causes their extirpation before metastases can develop. Cases of diverticuli, papilloma and sarcoma are reported, but are rare occurrences. One surgeon, finding sarcoma in an appendix after operation, reopened his patient on the fifth day and resected the cecum.

But aside from the striking, oftentimes disastrous phenomena incident to acute appendicitis, about which physicians and the public are already informed, there is a wide domain including functional disorders of the organs of digestion and assimilation, in which the "chronic appendix" plies a stealthy and baneful influence.

*Extensive clinical experience and careful microscopical examina-*

*tion of large numbers of appendices prove that this most vulnerable member very frequently seriously disturbs the functions of the stomach, duodenum and the gall-bladder; and experiments on animals show that it can be the primary cause of ulcers in the former.*

Chronic appendicitis so often masquerades as disease of the gall-bladder or as ulcer of the stomach, that many of the best surgeons, until recent years, were misled thereby to do operations on the gall-bladder which did the patients no good unless the appendix was removed at the same time, likewise to do gastroenterostomies from which the patients derived more harm than good unless the appendix was also removed. Many of these stomach operations were later undone and the surgeons quickly learned that it was the appendix and not the stomach which required operation (Graham and Guthrie[18]). Since then most surgeons of mature experience have repeatedly wiped out cases of persistent stomach disorder, that had often been treated as ulcer, with one stroke of their scalpel upon the appendix. The writer could cite most convincing cases of this kind, as could probably every fellow at this meeting, if time permitted. B. G. A. Moynahan has emphasized "appendiceal dyspepsia." (19) He says it resembles the symptoms of ulcer of the stomach but not with such precise regularity of relief after food, and recurrence of pain later and is more frequently aggravated by exertion and more accompanied by vomiting. Moynahan states that he has seen blood vomited in considerable amounts in such cases, that simply show a contracting pyloric spasm when opened up and not yet manipulated, but no anatomical signs of ulcer. He removed the appendix in twelve out of fourteen cases of operation for duodenal ulcer, (20) and found it to be diseased in every case. The other two patients were in too poor a condition for the additional operating. He says: "We examine and remove the appendix, approximately in nine out of ten of all cases. In 80 per cent. of those removed there are evidences of long-standing and advanced disease." Again, "I have long held the view that diseases of the stomach, duodenum and gall-bladder, with which the surgeon deals are not primary but secondary. They are the result, in my opinion, of an infection or a toxemia which has its origin, for the most part, in some abdominal organ." He thinks that ulcer of the jejunum following gastroenterostomy, may be due to the persistent evil influence of a diseased appendix, when this has not been removed at the prior operation. Graham and Guthrie agree with Moynahan in the differential diagnosis of this



form of dyspepsia from ulcer, except as to the vomiting of blood, which I have not found to be confirmed anywhere. They dignify the appendix as equal in rank with the gall-bladder and the stomach, in producing this triumvirate of causes of upper abdominal symptoms, of which they present a good differentiation.

Mahnert(21) observed twenty-three plain cases of diseased appendix in thirty-six plain cases of stomach ulcer, and remarks, "the frequency with which we find *ulcus ventriculi* and appendicitis associated is astounding." He says the chronic appendix should be removed as well as the acutely inflamed one, that the former is less dangerous to remove than are the conditions it leads to when left to expectancy.

Paterson(22) says 66 per cent. of his cases of stomach and duodenal ulcer were found to have diseased appendices when examined after incidental removal. He coined the name "appendiceal gastralgia" and says this is removed in 90 per cent. of the cases by removal of the appendix. He cites three cases of very pronouncedly diseased appendices that were really dangerous, and still had caused no local symptoms at all.

Barclay(23) had forty-one cases of "chronic indigestion" referred to him which he says were cured by removal of the appendix, although ten of them never presented any local symptoms.

Corner(24) under the caption "unconscious, undiagnosable and unrecognizable appendicitis," cites three cases in which a number of good physicians and surgeons discovered no local symptoms or signs at all, when grossly bad appendices were present—containing stones, club-shaped severe constrictions and adhesions, etc. He says: "When the appendix can be removed safely and cleanly without overendangering the patient at an abdominal operation, it should be done." "The appendix is not removed too often."

In the experience of E. M. D. Stanton,(24) the upper abdominal symptoms of a diseased appendix are such an essential part or accompaniment of it, that pain, tenderness, etc., occurring in the right lower quadrant without the referred or reflex symptoms, is not due to the appendix, as its removal only results in failure, but is due to an enlarged or displaced cecum, Lane kink or other form of enteroptosis. On the anatomical side of this question the following are most noteworthy aside from the extended researches referred to in the beginning: MacCarty(25) carefully examined the appendices that were removed in connection with

fifty-nine gall-bladder operations, and found 69 per cent. of them diseased. He remarks that similar changes are found in people who have never had appendiceal symptoms and likewise, that in a former series of appendices examined postmortem of persons dying of sundry infections, he found chronic inflammatory changes, chiefly connective tissue hyperplasia and its distorting effects on the different layers of the appendix, in nearly all specimens examined; that for a normal appendix one must look to a young child or the new-born. Again, according to the investigators Lanz, Brunn, L. Aschoff, Faber, Nowicki, MacCarty and McGrath, obliteration, partial or complete, of the lumen of the appendix is the result of previous inflammatory action; *i.e.*, a token of preceding disease. MacCarty and McGrath found this token in 17 per cent. of 2549 cases of general autopsy; in 17 per cent. of seventeen appendices removed during operations for pylorospasm; in 23.5 per cent. of 1005 removed for appendicitis; in 26.9 per cent. of those removed during fifty-two operations for gastric and duodenal ulcers; in 52 per cent. of fifty-seven specimens removed during as many operations for cholecystitis; and in 44.8 per cent. of those removed during 118 operations for cholelithiasis. They also examined the appendices removed during other upper abdominal operations aside from those named, also those removed during lower abdominal and pelvic operations, and noted the clinical features in 2000 of these cases. They conclude that all patients with such an appendix had more epigastric symptoms than those whose appendix retained its lumen.

As to the question, how the appendix transmits its evil influence to other abdominal organs, the assumption of infection has received some support, at least as to ulcers of the stomach and duodenum, by a series of thirty animal experiments performed by Prof. Payr(26) upon a few dogs and cats but mostly upon guinea-pigs and rabbits. In searching for the cause of these ulcers, Payr produced thrombi in veins of the omentum or of the mesentery of the large or small intestine, in gastroepiploic veins and in veins from the appendix. The thrombi were produced by injecting into the veins an emulsion of dermatol, Chinese toilet powder, olive oil, vaseline, or paraffine and olive oil combined. One or several pigments were sometimes added. In other instances the thrombi were produced by heating or freezing the parts. Many of the animals died inside of two days. The others were killed in from three to five days and carefully examined.

Aside from the necessary changes in the liver, the stomach mucous membrane showed hemorrhagic spots or areas with or without ulceration, visible at least by a lens, in every animal excepting several rabbits. The emboli were likewise traced, in a number of instances, within adjacent venous radicals. This subject of retrograde embolism had previously received notable contributions by Recklinghausen,(27) Heller,(28) Arnold,(29) and Lubasch.(30) Payr says that this backward floating of emboli in the veins occurs in conditions of engorgement particularly during sudden interchanges between positive and negative internal pressure, such as occurs in the abdomen in the act of vomiting and in the thorax during coughing.

But the theory of infection, etc., will not account for the referred or reflex functional epigastric symptoms which occur in persons whose appendix is a solid cord with the lumen obliterated. No infection can arise from those; but the sympathetic plexuses of Amerbach and Meisner are still there, and are sending out distress messages from the effects of cicatricial contraction upon them, which messages are undoubtedly forwarded to the solar plexus by the sympathetic, in a similar manner as many a gynecological message is passed up.

*The appendix is too treacherous to be trusted when it appears normal.* The fact that the microscope finds dangerous conditions in apparently normal appendices, proves that it is difficult, often impossible, macroscopically to say whether a given appendix is normal or dangerous, as is affirmed by a number of writers.

Two nurses were operated by the writer for impending invalidism due to simple but extreme retroversion. There was no history of appendiceal attacks nor any present signs of such disease. The one was treated by my formerly preferred bi-inguinal route; but could as well have been given a median section, as was resorted to in the other case, in which the appendix was studied most carefully by sight and touch, and dropped for purely sentimental reasons as healthy. I had to do an emergency operation for acute violent appendicitis in each case, respectively eight and eighteen months afterward. The women then became well and strong. But the second much more dangerous operation should, and could as well as not, have been avoided at the time of first operation. This should be no indifferent matter to any surgeon. On the other hand, an appendix that has given rise to most serious trouble, may become very innocent in appearance again. A farmer had appendicitis and was treated for it medically. A

large lumbar abscess formed that was incised by the doctor; but it would not stop discharging. He came to me with such a fistula leading toward the right kidney. I opened up the whole region and found a fecal stone (examined by a pathologist) near the right kidney. I at once looked for the appendix and was surprised to find it perfectly healthy in appearance, aside from a few adhesions.

L. C. Fischer had to do appendicectomy after other abdominal operations in two cases, and on inquiry of a number of operators, found that E. C. Davis, Geo. H. Noble, Joseph Price, H. A. Kelly and J. B. Murphy had a similar experience. Howard A. Kelly also found six such cases in the literature and most wholesomely advises that the normal appendix had better be removed when it can be reached in the area of operation, because it is liable to become adherent and dangerously constricted. Fowler(32) had two such cases of appendicitis after operations for pyosalpinx and says: "Ever since the occurrence of these two cases, I have made it a rule to perform typical excision of the appendix, when the latter is intraperitoneally situated, in every case in which the abdomen is opened for any operative structures within reach of this mischievous and useless organ." Weiswange(33) did a laparotomy for pyosalpinx, and found the appendix normal, but could as well have removed it. After a few days, temperature and local signs of infection appeared. An exudate was drained into the vagina, but a discharge persisted from the lower end of the abdominal incision, in spite of several exploratory efforts from various directions. Finally another laparotomy was needed, and the end of the appendix was found adherent at the margin of the first incision and causing the trouble. Weiswange holds that the appendix should be removed in all gynecologic laparotomies, if possible. He says we cannot tell macroscopically whether the appendix is normal, and we are often deceived. Kroenig and Pankow also take this stand, he says, although it may mean removal of 40 per cent. of healthy appendices. Sava-rioud(24) of Paris says: "My conclusions after due study of appendicitis are, that it is much better to prevent an attack than to attempt a cure. Awaiting the day when it shall be the proper thing to remove the appendix from everyone, so as to do away with the disease altogether, I would advocate at present that when the appendix yields the slightest suspicion of being affected, its removal should be enforced."

To those who are sure to be able to diagnose a healthy appen-

dix, the following, cited by Nowicki, is a good lesson: A man of thirty-eight years, suspected of having his first attack of appendicitis, was operated for this at the Lumburg Hospital, but the appendix was found "normal," and the abdomen was closed. The patient continued in a septic course and died. Autopsy showed a small retrocecal abscess that communicated by fistulæ with both the appendix and the cecum. Further as to prophylactic removal: Maurice H. Richardson(35) says, "I am beginning to see the value of normal appendectomies performed in the course of other abdominal operations; for in several cases other causes for peritonitis have been recognized in the absence of the appendiceal cause." And, "I have been obliged to operate for acute appendicitis in several patients, because I had not removed the appendix when I could have removed it early and safely during operations for other lesions." I even favor its removal when apparently normal, if it is easily accessible during other abdominal operations, for I believe that it is a threat to every life, no matter how innocent it looks."

Furthermore, McWilliams(35) in a very good report of all appendectomies performed in the Presbyterian Hospital of New York, during 1906, 1907, 1908 and 1909, amounting to 1411 in all, says that 212 of them were done incidentally during laparotomies for other reasons and a few of them in conjunction with other than abdominal operations. He says, "I have seen no list of such operations to prove that the removal of the appendix will prejudice recovery."

*Contraindications.*—Of course there is a limit to this prophylaxis. Some patients are taxed to the utmost by the severity of the main operation or because they are in bad condition. Often the field of operation is a badly soiled or infectious one and the appendix lies separate from it in surroundings that should not be invaded from such a field unless the appendix has given evidence of present disease. Furthermore, abdominal sections for carcinoma or sarcoma or tubercular disease are too grave in themselves, and the dangers of recurrence overshadow those from the appendix. Again in people who are fifty years in age, appendicitis occurs in a rapidly decreasing ratio, while their heart and kidneys present rapidly increasing defects. They do not well bear any addition to their surgical risks.

In my own work, in the last 700 abdominal sections not for appendicitis or the appendix, and excluding all cases in whom the appendix had been previously removed, I have removed the

appendix 354 times incidentally or in 50.6 per cent. In a few instances deaths occurred, but I am satisfied that this little closing act in the operation had nothing to do with them. Two hundred and thirty-seven of this number were macroscopically diseased or abnormal. They were in the order of frequency: (a) club shaped with constrictions at the base or near the middle and filled with fecal matter beyond; (b) excessive length, 8 to 15 cm. (Nowicki says average length in middle life is 7.4 cm.) and often accompanied by adhesions; (c) entirely buried in adhesions with constrictions that sometimes cut it into links; (d) fecal stones; (e) bristles, bird shot; (f) worms, twice; (g) in one instance a tumor, the size of hazelnut, completely buried in adhesions was at end of a 5-inch appendix.

*Appendicostomy.*—At first thought, this little tube would seem to be very convenient for making an aperture into the cecum. But there are anatomical hindrances to it: (1) Its origin is an inch or more farther away from the abdominal wall than the nearest part of the cecum. (2) Its most frequent course, as studied by a number of men on large numbers of bodies, is transversely inward and downward, rather away from the abdominal wall. (3) It is held in its position by a more or less firm mesentery which carries its blood-vessels and often makes it difficult to reverse its course by cutting and stretching this mesentery without unduly injuring its vessels. The appendix, therefore, easily becomes gangrenous and a cecostomy is the result if the cecal wall has fortunately become sufficiently united to the parietal wall, and when it has not, a serious condition results, as shown by published cases.

C. A. L. Reed(36) says: "In conclusion, I wish to urge that cecostomy rather than appendicostomy should always be adopted as the operation of choice." He cites practically the same reasons. A cecostomy after the manner of a Kocher or a Kader gastrostomy is undoubtedly safer and more adequate in function.

In conclusion: the writer believes that the declarations and charges herein made against the vermiform appendix are sustained by the anatomical and clinical evidence submitted and by the precept and practice of many of the best surgeons; but he respectfully requests this honorable body of authoritative judges to make an expression on this subject with a view to establishing a rule of action in this matter that no one may easily evade.



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THE CHRONICITY OF APPENDICITIS.<sup>1</sup>

BY

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EVERY surgeon who has had much experience in abdominal surgery must have been impressed with the frequency or the almost constant presence of pathological changes in and about the appendix apparently without the slightest history of such involvements.

This is true of the operations performed for the so-called first attack of appendicitis and is especially true in the routine examination or removal of the appendix in conjunction with other abdominal operations.

In a review of 100 operations for appendicitis published by myself in 1909(1) there were thirty-one operations for supposedly first attack of appendicitis. In 50 per cent. of these there was unmistakable clinical evidence of previous inflammation of the appendix.

In the last 100 abdominal operations in which the appendix was removed as a routine procedure, pathological changes were found in 54 per cent. of the cases.

The general subject of appendicitis is well understood and while our literature abounds in contributions upon this subject, there are some facts relative to the etiology of the disease which still need clearing up. Sufficient emphasis has not been directed toward the chronicity of the disease as viewed from a pathological standpoint.

Our present conception of the etiology and pathology of acute appendicitis may be briefly summarized as follows:

The acute attack is often founded on the basis of a preexisting inflammation of the appendix, this inflammation, as a rule, having been so mild as to escape the notice of the patient. The acute inflammation itself is dependant upon bacterial invasion. Many varieties of bacteria have been found, the most common

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

being the bacillus coli, streptococcus, staphylococcus and pneumococcus while later investigations have shown the presence of certain anaerobic bacteria in combination with the above mentioned. The infection takes place by way of the intestine (enterogenic origin) into the cavity of the appendix, whose long narrow lumen offers poor facility for drainage and is easily obstructed. Obstruction or stenosis of the lumen may be due to a variety of conditions arising either from within or without the appendix. The most common causes are fecal concretions, slow infection of the interstitial portions of the appendix together with narrowing of its lumen by bacteria of low virulency, stenosis or partial closure from adhesions, a contracted mesoappendix or an appendix adherent to the surrounding viscera. Stenosis of the lumen either partial or complete leads to the retention of secretions within the appendix, the bacteria which are normally present become active and diffuse inflammation, gangrene or perforation results, which is manifested clinically in what is known as an acute attack of appendicitis. It is thus apparent that from a strictly pathological standpoint, the so-called acute appendicitis is but an acute exacerbation of a chronic process.

Wilms(6) has emphasized the fact that in the appendix itself there are no sensory nerves, but like the intestines such sensory nerves are found in the mesenterolium therefore inflammatory conditions may exist in the appendix without pain. Pain in appendicitis is present only when a lymphangitis of the mesenterolium exists or peritoneal irritation occurs.

For a proper consideration of the etiology of appendicitis we must distinguish between the changes in the appendix which predispose an acute attack and the changes incident to the acute attack itself.

Some recent additions to our knowledge of the physiology and pathology of the colon, seem to explain to a large extent the cause and frequency of chronic appendicitis as well as the changes in and about the appendix which lead to an acute attack. I refer to the antiperistalsis of the ascending colon as described by Cannon; to the cecum mobile of Wilms, the kink of the terminal ileum (Lane) and pericolitis dextra or Jackson's membrane.

Canon(2) in 1902 reported and described a characteristic antiperistaltic movement in the proximal colon of the cat, a movement of waves backward toward the cecum. These waves are described as being rarely continuous over a long period of time,

but consist in a series of waves at the rate of about five per minute and are of four or five minutes' duration.

These antiperistaltic waves have been confirmed by other observers and Jakob(5) has described in addition thereto certain circular muscular bands about the hepatic flexure of the colon. That such antiperistaltic waves occur in man is based mainly upon inferential evidence drawn from cases of cecal fistula.

In such cases Cannon relates that rectal enemas have been observed to traverse the entire length of the colon and to escape through the artificial opening. Even after transplanting the ileum into the transverse colon the discharge through the fistula continued. Cannon thinks such a reversed current is certainly consistent with effective anastalsis in man. X-ray observations have also shown the condition in man as reported by Rieder, *i.e.*, a to and fro churning or shifting movement of the contents of the cecum and ascending colon.

The presence of such antiperistaltic waves forcing the colonic contents downward into the cecum, together with the entrance of the semifluid contents of the small intestine, must of necessity cause a stasis in the lowermost portion of the cecum and ascending colon. As described by Cannon, "the stagnant mixture of indigestible matter, food, cellulose, water and bacteria, presents an ideal condition for putrefactive and fermentative decomposition."

The appendix with its opening in the lower part of the cecum is favorably situated for receiving and retaining within its lumen any portions of the intestinal contents plus bacteria which may be forced into it.

The frequency of fecal concretions in the appendix can only be explained in this manner. Such a condition of stasis in the cecum may also explain the typhilitis and perityphilitis of the older writers and undoubtedly accounts for the frequent involvement of the appendix by those changes which eventually lead to an acute inflammation of the organ.

Another condition of the cecum which produces stasis of its contents and which has an etiologic relationship to appendicitis is that described by Wilms(6), to which he has given the name of cecum mobile.

Wilms endeavors to establish an hitherto undescribed clinical entity. In this condition the cecum is abnormally long and mobile, it may be greatly displaced, distended or have a high

degree of atony of its walls. It is closely allied with obstipation its principal feature being a stasis of the intestinal contents in this part of the alimentary canal. The condition is nearly always associated with chronic appendicitis but is sometimes seen with a normal appendix.

Wilms ascribes the failure to cure chronic appendicitis by appendectomy to the presence of cecum mobile.

On account of the stasis which it produces, cecum mobile must be considered as one of the predisposing factors in the production of chronic inflammations of the appendix.

Adhesions about the ascending colon and cecum, the so-called Jackson's membrane or pericolitis dextra,(8) are often seen in operations for chronic appendicitis, they are often associated with the band of adhesions as described by Lane(11) which crosses the ileum near its terminal portion. Many theories have been advanced regarding the etiology of such adhesions.

Jackson(8) has recently discussed the various theories offered in explanation of their origin.

The two principal theories advanced are (a) the inflammatory and (b) the congenital. The inflammatory theory as advanced by Gerster(9) supposes a preexisting colitis, while others think that these membranes are the result of old inflammatory processes about the appendix and gall-bladder region. In the congenital theory the causes given are: faulty development, failure of the cecum to settle down after rotation of the colon and the attachment of portions of the omentum to the cecum during rotation of the large bowel. The congenital theory seems to be gaining in favor as it corresponds more closely than does any other theory to the minute anatomy of such membranes. Clark and Kuehne(10) have concluded that Lane's kink is of congenital origin and that in the female it is continuous with a fold of the broad ligament.

As Lane(11) has pointed out, adhesions of the appendix, cecum and ascending colon are frequently associated with a kink of the ileum, therefore congenital adhesions of the appendix itself, the result of rotation of the colon and descent of the cecum, must certainly occur and should be emphasized as one of the predisposing causes of appendicitis.

Obstipation and intestinal stasis are as a rule the results of colonic adhesions and as such they are important factors in the production of those inflammations which eventually lead to an acute attack of appendicitis.

## SUMMARY.

1. Infection of the vermiform appendix is of enterogenic origin, and as a rule is a slow process resulting from stasis of intestinal contents in the cecum.
2. Appendicitis is essentially a chronic disease. Chronic inflammatory changes in the appendix usually precede the acute attack.
3. Stasis in the cecum is favored by the antiperistalsis of the ascending colon in combination with a mobile cecum or adhesions about the ileocecal junction.

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## DISCUSSION ON THE PAPERS OF DR. GOLDSPOHN AND DR. JACOBSON.

DR. WILLIAM SEAMAN BAINBRIDGE of New York City, agreed with the essayists who urgently advised the removal of the appendix whenever one comes within reasonable distance of it while operating for other intraabdominal conditions. About ten years ago, while discussing this subject with several gastro-



intestinal specialists, the objection was made that a number of cases had come under their care in which there was more stasis in the caput coli and ascending colon after removal of the appendix than had been noted in similar cases in which there had been no appendix operation. At that time the chronic type of appendicitis, not the acute, was under discussion, and the claim was made that in a certain proportion of cases the surgeon caused a definite weakening of the ascending gut and the caput coli. This contention caused him to review, in his mind, his duties in the "dead house" as well as on living subjects. These studies resulted in what he believed to be an important point that is sometimes overlooked in the removal of the appendix; viz., *failure to again attach the caput coli in such way that it can best perform its function.* In order to do this, the longitudinal bands which arise at the base of the appendix must be given a strong point of origin, just as they had before removal of the appendix, and not left without proper support. Sometimes, when the appendix is removed, no matter by what method, it is pulled away from this point of fixation, the longitudinal bands cannot perform their function properly, the cecum does not empty itself, and the caput coli becomes more of a cesspool of putrefactive material. It is, therefore, of importance that the three longitudinal bands be properly approximated, so that they may exercise their function, which, it must be borne in mind, is apart from that of the circular muscular fibers. Unless this function is maintained by proper approximation, the longitudinal muscles atrophy, peristalsis is interfered with, intestinal stasis results, and the gastrointestinal specialist is vindicated in the contention to which the speaker referred.

Dr. Bainbridge illustrated on the blackboard the points made with reference to the longitudinal bands and the caput coli.

His method of removal is that first described by him some years ago in a monograph on operative gynecology. After removal of the appendix the opening in the bowel is closed by inverting the edges of the stump with forceps as the purse-string suture is tied. Subsequently a celluloid linen stitch is introduced into the ends of the longitudinal bands, encircling the line of sutures already introduced. The sutures used to ligate the mesoappendix, having been left long, one or more of these are tied to the linen holding the base of the longitudinal muscles. All raw surfaces on the mesoappendix is turned in, or sutured over the end of the caput coli. Thus not only is the stump of the appendix securely closed and all raw surfaces treated so as to prevent adhesions, but in addition the important function of the longitudinal bands of the large intestine is not interfered with, as these muscles are again given a strong point of origin and not left without proper support. Some at least of the troublesome bowel symptoms following in the train of appendicular operations may thus in a measure be prevented.

DR. HENRY S. LOTT, Winston, North Carolina.—For the past

year my treatment of appendicitis has been very simple. If it is possible, I get the cases early; I give no purgatives, and make no local applications. I just take out the appendix. If the cases are clean, I close them; if they are dirty or even markedly borderline cases, I put in a gauze wick, and keep them on the right side, with a pillow between the knees, letting the wick alone until it is loose. About the fourth or fifth day, I empty the lower bowel with a normal saline enema, and keep them chiefly on fluids for about a week.

And the beauty of it all is, that they are comfortable and get well. The few exceptions are the delayed cases, with general peritonitis and fatal infection.

DR. LOUIS FRANK, Louisville.—It has been my practice in putting in a purse-string suture to prevent the splitting of the peritoneum of the mesentery of the appendix, to catch it up as the purse-string goes around and thus holds it in place. The suture that is inserted goes around the appendix. In that suture the three bands will be caught. I cannot conceive that a purse-string suture put in the caput coli, after the bands are brought together, will not turn them in. If the mesentery is caught, which I believe is the practice of a great many men, to prevent splitting, we will see very little of the trouble spoken of. The bands can be held by any purse-string suture.

DR. E. GUSTAV ZINKE, Cincinnati.—The point made by Dr. Bainbridge is to me a new and very important one. I am much impressed with it. I have done the operation which he described, but not for the reason he mentions. I did it merely to leave the cecum in the position where I found it.

DR. BAINBRIDGE, continuing the discussion, said Dr. Noble had been discussing something else rather than the suggestion he had made. He reiterated his contention that the longitudinal bands do not perform the same function as do the circular fibers. Dr. Noble spoke of the fibers in the region of the ileocecal valve; the speaker was talking about the point at which the longitudinal fibers are attached, or have their origin. This point is the head of the colon, where the appendix is situated.

DR. THOMAS B. NOBLE, Indianapolis.—I have been very much interested in what Dr. Bainbridge has brought before us. His idea is rather unique to me, and yet I am frank to say, I am not ready to accept it *in toto*. I do not wish to make any criticism of his methods. I think he is attaching to this organ a function which it hardly possesses and which we can question for various reasons. The first reason is, that our theory heretofore has always been that the appendix is a rudimentary organ which nature is trying to rid herself of in man. If we are to study the appendix in that light, we have to associate it with the lower animals. It is an interesting observation that we find it 8 feet in length as a cecal blind gut in the horse, and about 18 or 20 inches in length in the cow. It is 12 inches or so in the rabbit; it is 4 or 5 inches in the cat. In the deer it is about 15 inches in

length. In all of these animals it bears a distinct abdominal function just the same as the intestine. Dr Bainbridge is ascribing to these fibers and their relationship a sort of leverage function. The quadriceps extensor acts as a lever to a fixed point. The head of the colon or the ileocecal valve, to which he is attaching these longitudinal fibers to contract at a fixed point, is a point that I do not believe is well taken, because it is not a fixed point. It is a movable one. Then again, it seems to me, he is attaching to the longitudinal bands a function which they do not possess, as I have observed that they have no contractile power. They are not possessed of muscle, but are fixed points for the transverse fibers of the colon to pull against, and not in a longitudinal way. I have observed the colon often times in a state of contraction, and I have not seen this sort of function which he describes, namely, a contractile longitudinal function, but it is a contractile one laterally, and these fibers, it seems to me, are for the purpose of offering resistance to the laterally contracting fibers.

DR. ALBERT GOLDSPOHN, Chicago (closing the discussion).— I wish to thank the gentlemen for calling attention to the improvement in technic. Our attention has been called to the function of the longitudinal bands, whatever that may be. If these bands have enough of muscle in them to contract, it will make some difference whether the point of the cecum has some attachment below or not. It seems to me, however, that there is much more muscular substance in the circular layer, and the contraction of the circular muscles enclosing the pouches empties the cecum. I will simply mention a part of my paper which I was not permitted to read on account of lack of time.

The chronic appendix is on trial in the medical world. It is charged with causing organic disease of the gall-bladder and of the stomach, and an infinite amount of minor medical ailments of the same nature, but of lesser degree. Circumstantial evidence is so accumulating as the result of much clinical and pathological investigation and animal experimentation during the last ten years that it can scarcely escape conviction. Although it is all circumstantial evidence, it is so strong that we have no other way of explaining the results. It has been proven to be the one weak spot, the *locus minoris resistentiae* in the entire alimentary tract. How is this influence transmitted? For the answer to this question I must advise a careful reading of my paper.

OMENTAL CYSTS.<sup>1</sup>

(WITH REPORT OF A CASE.)

BY

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(With Two Illustrations.)

THE literature on the subject of omental cysts is not only scant, but shows a great variety of opinions as to the interpretation of the word cyst. A perusal of reported cases shows that practically every variety of tumor or growth, in which there was fluid present, has been included under that head. The word cyst, as it is generally used, and particularly with respect to the comparatively few cases that have occurred in the omentum, conveys practically no idea of the character of growth which it is presumed to describe. This is true, in a measure, in the use of the word in general surgical literature, and it would seem that, if we are to use the term cyst, it should be restricted to mean localized collection of fluid within a limiting membrane without definite reference to the pathology, whereas the term cystoma could, and should, be more properly used to characterize actual, new, cystic growths, in which we have secreting cyst spaces, and a definite, constant, neoplastic formation.

The subject, then, of true omental cystomata, as the reporter's case should properly be called, becomes of some interest as a pathological study notwithstanding its great rarity.

The first case of this kind was described by Gairdner, in 1851, and since then there have been, according to some reporters—Dowd, for instance—some thirty-seven cases recorded. Since Dowd's report, Stillman has recorded two cases, and there have been three additional cases reported by Markoe, which, with one other found by me but overlooked by Stillman and my own case, would bring the total number to forty-four.

A careful analysis of these, however (which, by the way, has been made by Stillman in his excellent report before the Section

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

on Surgery, at meeting of the A. M. A., in 1911), shows that, at the most, only nineteen of the cases at the time of his report are to be classed as true cystomata. I have found one additional case, undoubtedly a true cystoma, reported by Brandt, and my own case is unquestionably of such character. Of the three cases reported by Markoe, there is some question as to the pathology in two of them, and I would also question Case XVII of Stillman's, whose analysis of cases accompanies this report. The original report of this case is not sufficiently clear for one to judge of its exact character, and we have only the reporter's opinion as a basis for interpretation, and that is not positive, as the reporter says: "Seemingly it was a cyst of the omentum." The additional cases which Stillman reports are not included in his tabulation<sup>1</sup> which is as follows:

CASE I (Gairdner(1)). Woman, age not stated, died unexpectedly. At autopsy she was found to have a large fibroid uterus. In addition, a cyst was found between the folds of the great omentum measuring between 3 and 4 inches in length, and from 1 2 inch to 1 1 2 inches diameter. It contained a transparent colorless serum, containing numerous flocculi.

CASE II (Gooding(2)). Girl, aged eighteen, noticed a lump about the size of a hen's egg low down in the right iliac fossa, which was painful, chiefly at menstruation. At time of operation, four years later, it was the size of a cocoanut. It was diagnosed as an ovarian cyst with a long pedicle. Operation disclosed a cyst in the gastrocolic mesentery firmly adherent to the parietal peritoneum and imbedded in the folds of the omentum. There was no pedicle.

CASE III (Spencer Wells(3)). Girl, aged five, had had a large abdomen since infancy, growing steadily for part two years. On operation a single cyst of the omentum was found attached to the abdominal wall and cecum. It contained four pints of a clear, watery fluid. In the upper part of the omentum were a few small cyst-like collections of fluid resembling grapes. Some were removed, others simply pricked. A specimen was examined by Ransom, who found it to consist of three very thin-walled cysts, the largest holding a quart, the next half a pint, the smallest the size of an egg. There was no endothelium on the inner surface. He states that it was not hydatid; but he thought perhaps it was inflammatory.

CASE IV (Erdheim(4)). Woman, aged twenty-two, had a tumor, first discovered five years before, without known cause; according to the patient's account it reached its present growth in fourteen days. Operation disclosed a bluish, transparent

<sup>1</sup> Doubtless other cases of omental cyst have been observed, but there has been failure to report them, either through lack of recognition of the character of the tumor, or lack of knowledge of the rarity of the condition.

cyst wall adherent over a wide area and covered with omentum. The tumor reached from the transverse colon to the bladder and had no connection with any of the pelvic organs.

CASE V (Marfan(5)). The patient was a girl, aged two and one-half years. Her mother had noticed that the abdomen had always been large and at the age of fifteen months the enlargement began to increase and continued to do so steadily for the succeeding year. The general health was not affected until a few weeks before operation, when the child became emaciated. An aspirating needle was inserted and about two liters of black hemorrhagic fluid evacuated. This gradually reaccumulated, and it was decided to operate. Operation revealed a multilocular cyst within the folds of great omentum. It had a pedicle and contained a large quantity of bloody fluid.

CASE VI (Hearn(6)). The patient was a boy, aged eight. At birth, his physicians noted that the abdomen was markedly distended. This disappeared after a few weeks and was not again noticeable until he had become six years of age, when the abdomen began to distend. In the meantime, he enjoyed good health. Although the abdomen increased rapidly in size, the only difficulties he experienced were those due to distention and pressure. The abdomen was enormous, measuring 44 inches in circumference, and an omental cyst was suspected, owing to lack of symptoms of other troubles. Operation disclosed a cyst containing a dark yellowish-brown, turbid fluid and many other cysts. After evacuating a number, the mass was drawn out and found to be attached to the great omentum, between the folds of which it had developed. The fluid was alkaline in reaction and contained a large amount of albumin. Jacobi regarded this as a case of hydatid cyst and instanced it as a warning of the care and circumspection required in making an accurate diagnosis in cases of cyst of the omentum. From the history, however, I cannot see why this statement should have been made.

CASE VII (Braithwaite(7)). Girl, aged four, measured 22 3/4 inches at level of umbilicus; this had increased during two months. The tumor was found to be entirely within the folds of the great omentum and with the exception of adhesions to the intestine was easily removed. It contained 3 1 2 pints of fluid.

CASE VIII (Jacobi(8)).—The patient was a girl, aged seven. Four years previously the abdomen began to swell and the child lost weight. A diagnosis of tuberculous peritonitis was made, the abdomen tapped and 2 quarts of a clear, slightly bloody serum was drawn off. After two years the swelling returned and was tapped a second time. Subsequently it was operated on. Operation disclosed a large cyst, containing about 2 quarts of fluid, with a number of recesses communicating with the main cyst. It involved the greater part of the great omentum and narrowed into two pedicles as it approached the colon. The cyst



was lined externally and internally with endothelium. The contents were gelatinous and finely granulated, and consisted of coagulated serum with multinuclear and eosinic forms of leucocytes, endothelial cells and a few red blood-cells. Staining by Weigert's method showed absence of fibrin.

CASE IX (Marsh and Monsarratt(9)).—The patient was a girl, aged one year eight months, whose abdomen was noticed to be enlarged about four months previously, but there was no complaint of pain. It was tapped four times. Operation showed a thin-walled multilocular cyst springing from the gastrocolic omentum and entirely enveloped in it. It contained about 10 pints, and consisted of one large cyst and many independent smaller ones, and it had an attachment to the right iliac fossa. The external surface was covered with endothelium; internally it was lined by a coat of fine connective tissue containing numerous blood-vessels. The walls of the smaller cysts were better defined and afforded better support for the blood-vessels than in the large cyst, where the vessels were large and thin-walled.

CASE X (Schramm(10)).—Female, aged one year. Swelling of the abdomen noticed four months before. Operation disclosed the fact that the entire omentum was made up of a conglomeration of cysts, varying in size from that of a nut to twice the size of the fist. About 3 or 4 cm. of the omentum, next the transverse colon, was quite normal. The cysts contained a clear rose-colored fluid.

CASE XI (Boyd(11)).—The patient was a boy, aged eleven, whose health was excellent until a few months before operation, at which time his abdomen began to swell and the swelling steadily increased. He had constant pain in the lower abdomen, but never of a severe character, and he had become much emaciated. Operation disclosed a large, thin-walled cyst covered by and occupying the cavity of the great omentum and containing a large amount of greenish-brown fluid. The cyst was attached to the pancreas, but did not spring from it.

CASE XII (Schwarzenberger 12)).—Girl, aged four and three-quarters years, was operated on by Czerny. The cyst contained 3 liters of a clear serous fluid, and was multilocular. It was diagnosed as a lymph-cyst of the great omentum.

CASE XIII (Young(13)).—Girl, aged nine and one-half years, had a swelling, noticed for more than a year previously. There was no pain. At operation, a thin-walled cyst was found containing many other cysts. It involved the anterior layers of the great omentum, part of which was normal, and adherent to the stomach. It contained 32 pints, besides 5 or 6 that were lost on the floor, of a dark brown fluid, which was evidently broken-down blood and serum. The fluid in the cyst was not examined.

CASE XIV (Matthews(14)).—Boy, aged eight, had complained nine months previously of pain in the left side, following which there was a gradual distention of the abdomen. This continued

till the abdomen measured 27 inches. On operation a cyst was found containing 6 pints of a dark brown fluid. It was attached to the transverse colon by a thick pedicle made up of omentum.

CASE XV (Fort(15)).—Girl, aged two and one-half, had an abdominal enlargement, noticed eighteen months previously. At the time of operation the abdomen measured 28 inches. There were no symptoms other than dyspnea. Operation disclosed a cyst between the layers of the great omentum containing an enormous collection of fluid. There was an absence of distinct capsule other than the peritoneal covering of the omentum, the fluid being between the folds of the omentum.

CASE XVI (Wakefield(16)).—Boy, aged four, had an enlargement of the abdomen; noticed at least two years before. At the time of the operation, the abdomen was enormously distended. Operation disclosed a tumor larger than a man's head, consisting of a number of various sized thin- and clear-walled cyst chambers, the bulk of the mass being made up of a single cyst. The fluid contained in the cyst was clear, straw-colored and neutral in reaction. It coagulated on heating with a drop of acetic acid.

CASE XVII (Rodman(17)).—Patient was a girl, aged seventeen. On operation, a cyst which, together with its contents, weighed 60 pounds, was found beneath the parietal peritoneum, covered by another layer of peritoneum. It had no pedicle, was unilocular and contained a clear fluid. It shelled out like a walnut, only one small vessel being tied.

CASE XVIII (Seefisch(18)).—Patient was a boy, aged four, whose mother had noticed a swelling in the abdomen a short time before. On operation, an enormous cyst was found dependent from the hepatic flexure of the colon by a pedicle the thickness of a lead-pencil. The contents measured from 2 1/2 to 3 liters. The wall of the cyst was very thin and consisted only of the web of the great omentum.

CASE XIX (Gifford(19)).—Boy, aged six, had a swelling, first noticed six months previously, when the patient complained of pain in umbilical and hypogastric regions. On operation, a cyst the size of a cocoanut was found in the substance of the omentum and was adherent to the anterior abdominal wall. The omentum was ligated and divided and the cyst easily removed. It was multilocular and contained a clear straw-colored fluid. The interior of the cyst wall was lined with a smooth membrane.

The additional cases mentioned by Stillman consist of one reported by Reginald H. Fitz, in the Lane lectures in San Francisco, in 1910. It was undoubtedly a true lymphangioma of the omentum, occurring in a woman who had a fibroid tumor to which the omentum was adherent. The details of this case I have been unable to secure, as Dr. Fitz has not yet published his lectures.

Stillman's case was that of a woman, forty-two years of age;

married, with one child, who was operated on account of an abdominal tumor diagnosticated as a pedunculated myofibroma of the uterus. At operation the tumor was found attached to the border of the great omentum, which was the seat of numerous, elongated, tortuous, thin-walled cysts, distributed through the omentum, involving similarly the gastrocolic omentum. His case resembles in description my own case, and is similar to that of Schramm, reported in 1903, and to that of Brewster, above mentioned, as reported by Fitz.

In Dowd's paper, in the *Annals of Surgery*, I find the case mentioned above, that of Brandt (from the *Centralblatt für Gynäkologie*, 1894, page 991) which is reported as a case of lymphadenectasis, undoubtedly a true lymphangioma of the omentum.

Hasbrouck's case, recorded in the *Annals of Surgery*, has been rejected from my own list, as well as from that of Stillman, as being a case of cystic degeneration of a sarcoma. Hasbrouck himself says: "The cell arrangement resembles some form of angiosarcoma. The tumor was partly solid and undoubtedly malignant, and not a true cyst." The reporter speaks of it as a mesothelioma, and in his collected cases reports several growths which I would unhesitatingly reject as not belonging to the class of tumors under consideration. In his paper he mentions thirty-four cases collected from the *Index Medicus*, of which, according to his interpretation, only nineteen could be classified as true cysts of the omentum.

Undoubtedly, some of the growths reported as being of omental origin were of ovarian and uterine derivation, belonging to that class of tumors with which we are all familiar—the wandering type, where the pedicle having become attenuated, a new and more abundant blood supply becomes established from some other structure, the original attachment finally disappearing. I have personally seen a dermoid of this character attached to the bladder, and a fibroid attached to the intestine. In Dowd's paper, to which reference has been made, and which is of much scientific value, there are reported the cases of Catman, Waldy, Edebohls, and others, which cannot be classed as belonging to the type of tumors represented by the specimen presented. Dowd's own case is not a true cyst in the strictest sense of the word, admits in his conclusions, "that it was an hematoma of the omentum, edematous on account of a twist in the pedicle." His paper, however, is of much interest and worthy of perusal.

To a student of these cases it will be very difficult, on account of insufficient data, to fix definitely the classification to which Dowd's case belongs, and we have only his own opinion that it was an hematoma as confirmatory to our analysis of the case.

The last cases reported are those of Markoe and McPherson, in the *Bulletin of the Lying-In Hospital of the City of New York*, for March, 1912. Their first case should be excluded, as it is evidently a torsion of an omentum which had become incarcerated by a suspension band. Their Case III seems to me to have been a cyst of the infundibuliform process of the peritoneum about the round ligament, as the tumor is described as extending through the ring into the abdominal cavity. My own opinion of the case, from the description given, is that it was of this character, and that the omentum had been projected into the ring and became adherent to the growing tumor.

I have abstracted Markoe's cases as follows:

CASE I.—A nurse, who had been previously operated upon for retroversion, for which a ventral fixation was performed. In this case a small portion of the omentum was twisted upon itself like a cord and led down into the pelvis between the right round ligament and a fibrous band, which consisted of the former ventral suspension ligament between the uterus and the anterior abdominal wall. This portion of the omentum had stretched to about 7 cm. in length, ending in a mass the size and shape of a small hen's egg, which was greatly congested and filled with blood. It was not adherent to any of the surrounding tissues and was easily brought out into the abdominal wound and removed between two ligatures.

CASE II.—Patient applied to hospital for care during confinement, being in labor at the time. Examination of the abdomen revealed, just above the fundus of the uterus between the ensiform cartilage and umbilicus, a movable tumor which changed its position with respiration. This tumor was not particularly tender and could be easily moved about from one side to the other by the hand of the examiner. Seventeen days after recovery from delivery, which was uneventful, it was decided to remove the tumor mentioned. Examination at this time revealed another mass the size of an orange which seemed to be located in the left broad ligament; this was tender but not movable. Accordingly, under ether anesthesia, a median incision, 10 cm. in length, from the symphysis upward, was made, and on opening the peritoneum there appeared in the wound a tumor the size of an orange, evidently a growth from the omentum. To this was attached the vermiform appendix by many firm adhesions. The omentum was also adherent to the abdominal wall by moderately strong adhesions, which were cut and

tied, care being taken not to interfere with the circulation of the omentum. At the same time the appendix was detached from the cecum by the purse-string method, leaving it attached to the omental tumor, both being removed together. The pelvis was then explored and a normally involuted uterus found, which was pushed over toward the right side by another tumor the size of a small grape-fruit, lying anterior to the broad ligament and behind the bladder. This mass was firmly adherent and plainly a part of the omentum. With great care it was freed and upon removal proved to be a second omental cyst. Before closing the abdomen, inspection showed that both ovaries were normal and not involved in the adhesions.

CASE III.—Patient aged twenty-seven; ii-para. Stated that she had had a tumor in the inguinal region since birth, which she thought had enlarged somewhat in the last year, but was not certain on this point. Physical examination showed a woman well developed and well nourished, with nothing of importance noted except a tumor the size of a grape-fruit in the right groin. This was firm, slightly fluctuating and gave no evidence of impulse on coughing. It could not be reduced and was somewhat tender, probably owing to the pressure of the patient's corset. Bimanual examination showed the pelvic organs to be in normal condition with the exception of a retroversion of the uterus, and no connection between the tumor and the pelvic adnexa could be made out. The case was thought to be one of inguinal hernia, with the possibility of the sac containing an ovary and tube, but on cutting down over the mass it was discovered to be cystic, filled with fluid and found to be an omental cyst, which had prolapsed through the inguinal canal, and which was attached by a long pedicle. Inasmuch as an operation on the uterus was contemplated, a second incision in the median line was made and this pedicle, which sprang from the great omentum above, was tied off and the cyst was easily removed by way of the inguinal incision. The abdominal wound was closed in the usual way and the hernia then repaired in the ordinary Bassini manner.

The history of my own case and the full report is as follows:

Patient Mrs. J. B. M., æt. twenty-eight; mother of two children, whose family history was negative as to tuberculosis, tumors, etc., had not been seen by her family physician, until a few days before she was referred to me, since the birth of her last child one year previously. One year ago, at the birth of this last child, she had had a profuse hemorrhage, and it was thought at that time that she might have a fibroid of the uterus. Two months after the last labor there was some descent of the uterus, though this gave her no trouble after the introduction of a pessary. Three months later (seven months ago) she noticed an enlargement in the pelvis which had been gradually increasing in size. She had had a profuse discharge with a foul odor for the past three months, but attributed this to the pessary which

she had been wearing since the prolapse first made its appearance. Her bowels were constipated. There was no trouble about the bladder, no loss or gain in flesh, and except for the presence of the tumor she was in comparatively good health.

Physical examination showed heart and lungs normal. A cystic tumor was palpable in the abdomen in the median line, half of it above the umbilicus and the other half below. There was a protrusion of the abdomen about the size of two fists.

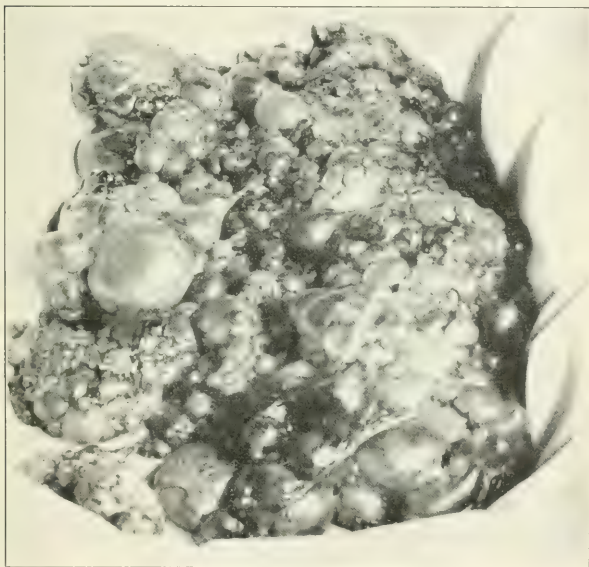


FIG. 1.—Omentum showing cystomata.

Per vaginam a number of nodules could be felt, apparently cystic in character, filling up the entire pelvis. There was apparently no fluid within the abdomen, but a diagnosis of probable intraligamentary ovarian cystoma was made.

She came to operation on March 22. Under anesthesia the growth was susceptible of limited movement within the abdomen. Upon putting the patient in the Trendelenburg position most of the mass seemed to fall away from the pelvis toward the diaphragm, and my assistant suggested that we probably had to do with a cyst of the omentum.

The operation, which was made through a right rectus inci-



sion extending from the umbilicus to the pubes, revealed a multilocular cyst of the omentum, with apparent implantation metastasis, as we thought at the time, on all the peritoneal surfaces, the cecum, small gut, mesentery, uterus, anterior and posterior layers of the broad ligament, and the tubes and ovaries were covered with the same character of cysts that composed the omental mass. These were very easily separated from each other and from their attachments to the parietal wall and other organs, the largest mass being in the omentum. The walls of the cysts were thin and their contents clear serum, and they varied in size from that of a pea to that of an egg. The various loculi and cysts were easily separated from one another. The ovaries were of normal size and appearance, except for the

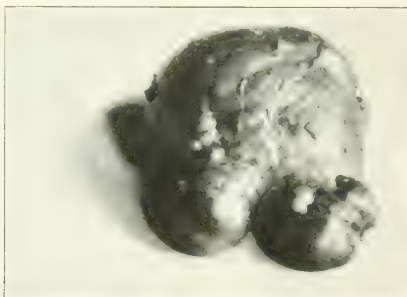


FIG. 2.—Cyst from over external ring (natural size).

attachment of the cystic growths mentioned. The tubes were normal. The uterus was normal in size and with soft walls. There was a bifurcated gall-bladder, the gall-bladder itself appearing to be pulled down by the attachment of one of the cysts to one portion of it. The liver was normal with smooth sharp edges. There was a cyst the size of a hen's egg in the groin over the external abdominal ring. This cyst did not extend within the abdomen, lying entirely external to the ring, apparently attached to the round ligament. There was no hernia nor was the ring patent. After closure of the abdomen this latter cyst was removed. Its appearance was similar to, and its contents apparently the same as the growths in the omentum.

Both wounds were closed without drainage and the patient discharged from the hospital, well, at the end of two weeks.

Macroscopical examination of the specimen shows that the tumor "consists of numerous globular masses of tissue filled with slightly opalescent, thin and slightly gelatinous material. These globular masses vary in size from a pin-head to a diam-

eter of 3 to 4 cm. They are held together with a rather vascular connective-tissue framework. Remains of omental tissue are hard to find, but here and there masses of omental fat can be detected. Other masses of tissue, much smaller in size, present a similar appearance. Macroscopical diagnosis: Multiple cyst of the omentum.

"Examination of the centrifugalized fluid shows no echinococcus'hooklets.

"*Microscopical Examination.*—The colloid-like material which fills the cyst-like dilatations presents a homogenous appearance. The connective-tissue framework is made up of a very cellular or edematous connective tissue. Here and there are numerous thin-walled blood-vessels and spaces, probably lymph spaces, lined with endothelial cells and devoid of colloid material."

It would seem, from examination of my case, that Jacobi's theory as to the origin of these tumors is borne out, he believing, with Rokitansky, who, in his *Lehrbuch der Anatomie*, describes tumors of the omentum, that they are "of lymphatic origin and the result either of dilatation of the lymph veins or a cystic degeneration of the lymph nodes."

It is believed by a great many reporters that these growths are congenital. As Fort says, there are three things that stand out in connection with these cases; (1) the impossibility of pre-operative diagnosis; (2) greater frequency in children, 50 per cent. occurring under the age of ten and 65 per cent. under the age of twenty, which leads to the belief that they are of congenital origin; and (3) greater frequency of these growths in women.

The diagnostic features I do not intend to discuss in this paper, as they are of minor interest. My chief object in reporting this case is to place it upon record in the archives of this Society, deeming it of sufficient interest and rarity to justify such a wish upon my part.

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405 ATHERTON BUILDING.

## A GOOD WAY TO TREAT FEMORAL HERNIA.<sup>1</sup>

BY

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EVERY incision for the correction of a hernia must be made with a contemplation of the proper care of the hernial contents, a preservation of the structures entering into the formation of the rings, and such reconstruction of the parts as to make a competent and lasting support.

Femoral hernia is no exception to this rule, and presents such characters and peculiar conditions as to warrant a more dignified place in our literature than it now seems to enjoy. It is always acquired, and constitutes about 10 per cent. of all cases of hernia. It is prone to strangulate, exists almost exclusively in the female, and in the natural course of events does not come to operation until some complication arises whereby the life of the patient is threatened and an operation is undertaken more to save life than to cure the condition.

This may account, in a way, for the large number of recurrences of femoral hernias as compared with inguinal. A fair estimate of recurrences in inguinal hernias is from 3 to 5 per cent., while in femoral the number is much higher, ranging from 25 to 30 per cent. Why should there be such a marked difference between the percentages of cures in these two types? It can hardly be said that the one has greater or more difficult complications than the other or that the anatomical structures entering into the reconstruction are more difficult of manipulation in the one than in the other. But whatever the reason the fact

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

remains that a very large percentage of femoral hernias recur after operation. In the latest edition of Kocher's work, reference is made to a review of over 23,000 cases by Potts, in which failure of radical cure occurred in 28 per cent.

This high rate of failures is surprising when viewed alongside the statement of Campbell that "as a matter of experience if the hernial sac be obliterated, any of the various methods for closing the femoral ring will result in a radical cure," or with that of Ochsner who says that "the most certain method of closing this ring consists in removing the serous membrane by removing the hernial sac to a point within the abdominal cavity and permitting the ring to close spontaneously." He further says that "all of the methods which have been devised for closing this ring are more or less harmful and tend to cause a certain number of recurrences." It would seem that there are quite a number of other operators, who are content with this simple plan of procedure. There is another class of surgeons, however, who insist on some form of closure for the canal; who believe that the peritoneum alone is not sufficient to hold up the abdominal contents even though the hernial sac has been ligated high up, who feel that the place of exit of any hernia becomes a *locus minoris resistentiæ* and therefore demands some artificial means for reconstruction. To those of the second class, the writer would submit the following procedure.

An incision 4 or 5 inches in length is made parallel with Poupart's ligament midway between this ligament and the saphenous opening. In older persons, it is best made in the sulcus formed by the thigh upon the abdomen. The subcuticular fat and areolar tissue is wiped by gauze dissection from the surface of the sac well down and into the external margin of the saphenous opening.

The skin and subjacent fat of the upper margin of the wound are then pushed upward until Poupart's ligament and the lower aspect of the fibers of the external oblique muscle are brought plainly into view. The base of the wound now contains the lower fibers of the aponeurosis of the external oblique, Poupart's ligament, the falciform process of the fascia lata, the saphenous opening, and the hernial sac.

One-half inch above Poupart's ligament and directly above the femoral canal, the fibers of the external oblique are separated, and a gridiron opening is made through the internal oblique and transversalis muscles down upon the peritoneum. The finger

now separates the transversalis fascia from the peritoneum, to which it is loosely attached, the separation being carried completely around the process of peritoneum which has been pushed down through the femoral canal to form the hernial sac. This completely frees the sac from all its surrounding tissues.

The peritoneum is now opened through the gridiron incision and an opening is also made in the hernial sac. This gives definite knowledge of the conditions of the hernial contents, and makes reduction much easier. If, as is often the case, a loop of intestine has been pushed through and has become strangulated, it will be found to be adherent by agglutination to the parietal peritoneum at the point of entrance into the canal, its hernial



FIG. 1.



FIG. 2.

portion will be black, thickened and edematous, and its lumen filled with fluid exudate. Or, it may be found that a process of omentum has long been occupying the sac and has become densely adherent to it. Whatever the pathology, reduction by this means is much simplified, and it is rarely necessary to enlarge the canal. When a coil of gut is found in the sac and its viability in doubt, it is brought through the gridiron incision following its reduction, and the freedom offered to its blood-vessels will soon determine that fact. If an exsection is necessary it is much easier and more safely performed through this opening than through an enlarged hernial canal.

After proper care has been given to the contents of the hernia, the sac is easily pulled up through the canal, tied and cut away.

The removal of the sac and pulling the lower margin of the wound forward, brings into view the upper margin of the hernial canal (now empty), Gimbernat's ligament, lower border of Poupart's ligament and the iliac vein. These structures are seen to form an isosceles triangle, the lower side of which is Gimbernat's ligament, the upper Poupart's, and the base the iliac vein. One or two sutures of No. 1 chromic gut are made to include the two sides of this triangle which when tied, completely obliterate the intervening space closing the canal.

In other words, with the vein in view, the ileopectinal fascia is sutured to the lower border of Poupart's ligament, and definite knowledge is had relative to the encroachment upon the vein. A running suture of plain gut next closes the gridiron opening, and a subcuticular stitch approximates the skin.

This operation is not presented as something new, probably many others are doing much the same operation. It has been denominated "a good way to treat femoral hernia," for the following reasons:

- It can be performed ordinarily inside of fifteen minutes.

- It offers free and easy care of the hernial contents.

- It preserves the anatomic structures in relation to the disease.

- It affords such a reconstruction of the parts as to make a competent and lasting support.

For six years, the writer has followed this technic with uniformly good results.

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#### DISCUSSION ON THE PAPER OF DR. NOBLE.

DR. CHANNING W. BARRETT, Chicago.—I wish to speak briefly of the advantage of operating from the inside upon femoral hernia over that of operating externally, although I have not operated from within except when the abdomen was opened for some other purpose. In performing external operations, however, it has always been apparent that we were operating at the wrong end of the hernial canal. I have operated through a median incision and after correcting the conditions, have separated the peritoneum from the lower angle of the incision to the femoral ring and in one case opened the peritoneal sac, thereby exposing the enlarged ring. Two or three chromic-gut sutures were used to close the ring by uniting the iliopectineal fascia to Poupart's ligament. In one case necessary pelvic work was done through a median incision and through this incision the left round ligament was shortened by going intramurally to the internal ring. On the right side we not only had



a femoral hernia, but an inguinal hernia as well. A rather large incision was made over the inguinal hernia and through this incision the femoral hernia was corrected and then the inguinal ring was closed, so that we did something of the same procedure that Dr. Noble has presented. In a case of adherent sac, the internal operation would have to be combined with an external incision to free the sac and this Dr. Noble's ingenious procedure provides for. My cases have not presented this difficulty.

DR. ALBERT GOLDSPOHN, Chicago.—I am very much surprised to hear the statement made that any surgeon should expect to cure a femoral hernia by simply obliterating the sac and doing nothing for the canal. What Dr. Barrett alludes to I have done likewise in abdominal sections, when the abdominal wall was relaxed, so that the parts could be made accessible from within and the sac could be withdrawn. I have likewise operated for both inguinal and femoral hernia by one incision, and then I have operated for femoral hernia or inguinal hernia in conjunction with the extended Alexander operation. You open up the inguinal canal for shortening the round ligaments, and cure an inguinal hernia by the right kind of closure of every Alexander wound a la Bassini. In order to expose the femoral canal it is merely necessary to retract the inner angle and lower margin of the incision downward and inward.

The stump of the ligated sac can be deflected away from the hernial canal for about an inch, by passing its ligature from within outward through the muscles by means of a good-sized curved needle passed in a reverse direction, with its thick end forward. An additional opening or incision is not needed.

As to closing the canal, my method is to put the finger on the vessel sheath, holding the vein, artery and nerve out of the way, and the inner edge of Gimbernat's ligament can be brought into view, otherwise you can feel it with the finger, and then pass a curved round needle with chromic catgut through its inner edge and then into the heavy fascia which lies over the pubic bone and approximate the two, making the fascia rise laterally to meet the inner edge of Gimbernat's ligament. I have had no difficulty in doing that but if the opening was large so that I could not make this approximation, then I would go up above and bring down the edge of the conjoined tendon and unite it to the fibrous structures and periosteum covering the upper edge of the inner end of the pubic bone, and cut off the femoral canal in that way.

DR. WALTER B. DORSETT, St. Louis.—I, like Dr. Noble and others who have spoken, have operated on these hernias from within. It seems to me, this is a combined method from without as well as from within. It occurred to me, when the doctor was explaining his diagram, that there is hardly any advantage gained by making a gridiron incision. In these cases the gridiron incision makes a small opening to work through, so that if the incision is made along the median line and the same technic

is easy in the reduction of these hernias from within, it would be a much better incision, in as much as we have more space in which to work. I rather think it is a hazardous procedure simply to leave the canal and allow it to close spontaneously, because the chances are the same condition will be present which caused the hernia at the beginning.

DR. MILES F. PORTER, Fort Wayne.—I think it is well for everyone of us who operates for hernias frequently to be acquainted with all of the tricks of the trade. I believe that there are certain general rules that apply to most all operations but in regard to hernias and most other surgical conditions there is no particular operation that is always the best. Generally speaking, I think there are certain things that should be done in a successful operation for the cure of hernia, and in the order of importance they appear as follows: First, obliteration of the sac. In abdominal hernia we know where the vessels make their exit from the abdomen. In the second place, after we have finished our job, we must, if possible, try to secure prompt aseptic union. Any operative procedure which entails an undue amount of injury, and particularly an undue amount of injury to the cellular tissue will, other things being equal, render the chances of an imperfect result greater, so that any undue separation or handling of the cellular tissue, particularly in a fat woman who has such a hernia, will add an element of risk so far as concerns the ultimate cure of the hernia.

Now, you speak of closing the opening. You cannot do so. It is absolutely impossible unless you shut that vein, and if you close it too tightly your patient by and by, in the course of months, comes to you with a dilated vein, if he does not come to you in a few weeks with an edematous leg. You must leave room for the vein to come through. Another thing it is wise to avoid, particularly in fat people, and to which I have called attention on previous occasions, is the vertical rectus incision in abdominal cases. If your operative procedures are in the immediate neighborhood of large vessels, the epigastric, for instance, and you have infection, you want to remember the possible danger of a serious secondary hemorrhage as the result of the involvement of the vessel walls in the dissemination of the infection. There is another objection to an operation of this kind or a similar one when you are dealing with a strangulated hernia. The rule is that you are dealing with infective conditions inside the belly. You should get the infective organs out and make the manipulation outside the belly and not draw the infection up into the noninfective abdomen, as you would do here.

One word regarding the gridiron incision. Anatomically there is no gridiron incision to be made. There is a little difference in angle; we split the fibers, we do not make a gridiron incision. There is no such thing as crossing the fibers there at all. You split the fibers, but you do not make a grindiron incision. The principle of dealing from above and pulling the

contents of the sac out has a good many times been applied to the treatment of hernia, and I would simply call attention here to some of the weak points in this and similar schemes for the treatment of these cases.

I would like to ask Dr. Noble if he has ever come in contact with the epigastric artery in doing this operation, or has he ever seen it? He has been operating in the immediate neighborhood of it where he ought to see it.

DR. NOBLE.—It is not wounded.

DR. PORTER.—It has not come into the operative field.

DR. NOBLE.—You may occasionally find it, but you push it aside.

DR. PORTER.—When in cellular tissue, if you can avoid manipulation or trauma in the immediate neighborhood of large vessels, you will avoid a source of probable danger, especially in very fat people. If you have much infection in these cases, and infection is very prone to occur where there is a lot of fat, one is likely to have a serious hemorrhage. As a matter of fact, I do not believe anybody has any business operating for the radical cure of femoral hernia who has 20 or 10 per cent. failures. I think he had better start his kindergarten work over again. I would feel if I had 10 per cent. of failures, that I would better ask my friend Noble to operate on these cases for me and I would get off the job.

DR. NOBLE (closing the discussion).—This procedure is not offered as a universal operation. The same measure will not make a coat for every man, and we are not trying to make a coat that will fit everybody, but as a means of meeting certain difficulties that we find in the treatment of this condition, and at the same time, curing it, I have found this operation a very satisfactory one. I believe that if some of you will remember it and do it some day, it will serve you a good turn or a good purpose.

I agree with the criticisms or objections made by Dr. Porter. I agree with him that the wider we enter into cellular tissue, fatty tissue, the more we are inviting disaster as a general rule. The more mauling and pounding we give to any of the raw tissues, the more are we at fault. This operation is easy. You do, Dr. Porter, make a gridiron incision, but not in every case. In some cases I have found the fibers are in line with those above. Again, I have found them at right angles. In making the gridiron incision we are warranted in adopting the principle because we do not injure tissue. We do not cut any nerve supply. We do not wound large vessels and do not interfere with nutrition. We do not bruise. We ought not to bruise or inflict injury upon any blood-vessel in this region. The operation offers the great advantage, and is a decided improvement, of treating the hernial content in this type of cases, as I have said, which oftentimes threatens the life of the patient. We often have to do a resection and empty the contents of the intestine as well. Both can be

accomplished through this opening. The opening is sufficiently ample to deliver the intestine and empty it of the lethal dose of toxin which, if left in the gut, may carry the patient off following a very proper herniotomy.

## CESAREAN SECTION IN DOUBLE UTERUS AND DOUBLE VAGINA.<sup>1</sup>

BY

N. STONE SCOTT, M. D.,

Cleveland, Ohio.

DURING the growth of the female fetus, the Müllerian ducts of the Wolffian bodies not infrequently fail to develop properly. The most common of these failures is the early arrest of the developing uterus, giving rise to the fetal or infantile variety of uterus in adult life. Even the complete absence of the uterus is not unheard of. Burridge in 1897 collected from the literature 350 such cases, while McCann and others make note of the absence of the entire internal female generative system.

In the process of normal fetal development the septum between Müller's ducts disappears, commencing below and extending upward. When the fetus develops abnormally, this septum may not even begin to disappear. Müller reports a case in which there was a complete reduplication of the internal generative organs, including the hymen. Or it may cease at any point; and, because the order of septum disappearance is from the lowest point up, double uteri are more frequent than double vaginæ. Thus it naturally follows that the presence of a partial septum at the vault of the uterus is not very uncommon.

Of the wholly double uteri, Dunning in 1889 was able to find in the literature 230 cases, and 144 of double vagina. In a review of the later literature, I have been able to augment the number to about 330 cases of double uterus, and 230 of double vagina.

To intimate that this small number is anything like an accurate estimate would undoubtedly be misleading. For this discrepancy between facts and records there is, however, a reason. This condition of reduplication, which on first thought would seem to be such a gross anatomical defect as to be easily discovered, is instead most easily overlooked, as will be readily appreciated by any one who has seen a case. Almost never is a vaginal

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

septum discovered by the patient or her husband. This difficulty in recognizing double vaginae is both illustrated and proven by the literature. For, of the cases reported, two-thirds were discovered at the time of pregnancy; of the other third a large percentage was found during rigid examination, necessitated by a stenosis of some point in the canal; while but a very few cases were found during the routine gynecological examinations.

Hicks of London reports a tumor in the right inguinal region supposed to be extrauterine pregnancy. On examination it was found to be right-sided pregnancy of double uterus and vagina. Delivery was uneventful. Later the patient was attended by another physician who failed to find the condition present.

The amusing story is told of two physicians in consultation. After each had examined the patient, the first said he found the cervix soft and dilated, the second insisted that the cervix was hard and undilated. They agreed that the examination must be repeated, whereupon each reported the condition formerly found by the other. Of course the explanation is simple: Each physician explored opposite sides of the vagina and uterus in the two examinations.

As to the frequency of the anomaly in the middle West compared with other parts of the United States, I am unable to say, except that I have so far found but one case reported from this section, that of Dr. Kelley, in the *Cleveland Medical Gazette* of 1885. But a cursory inquiry among a few friends has elicited the fact that several other cases have been noted in Cleveland.

Some twenty years ago, one of my young doctor friends told me of a difficult labor he had just attended, which impressed him as being out of the ordinary, though he could not satisfactorily account for the phenomena noted. The labor was long and tedious, but terminated spontaneously. After the birth of the child the perineum did not seem to be torn, but the patient bled very freely; and, protruding from the vulva, was a large tag of mucous membrane, which my friend was unable to identify, though he was very certain it was not the cervix nor any portion of it. This was probably a case of double vagina with laceration of the septum.

Aside from this doubtful case, I have heard of seven authentic cases, not including those in my own practice.

Dr. C. A. Hamann, in a private interview, described two cases

he had seen: One with a pregnancy in an undeveloped horn in which he did a resection of the pregnant thin horn to prevent rupture.

Dr. F. A. Bunts also tells me that he has had two cases, one of which had had frequent abortions of pregnancies occurring in the undeveloped horn; after the removal of the tube and ovary on this side, she had a full-term child.

At St. Luke's Hospital I was told that some months ago, Dr. Skeel divided the septum some time before confinement for a patient with a double vagina. A similar case is said to have occurred at the German Hospital a short time since in the practice of Dr. Hall.

The late Dr. Aldrich also told me of an interesting case of a cyst of the lateral wall of the vagina, which proved on more careful examination to be a case of double vagina, with stenosis of the external os of the small vagina.

In the course of three months, during the first part of this year, one general practitioner referred to me two cases of double uterus and vagina. One of these, in which I performed a Cesarean section, furnishes the basis of this paper; but I wish, before taking up that portion of my theme, to note briefly the other case brought to me by Dr. Garvin, as I believe some suggestions relating to the recognition of double uterus and vagina may be found therein.

*Case of Double Uterus and Vagina.*—Mrs. B., referred to me by Dr. Garvin for chronic appendicitis, retroflexed uterus, endometritis, etc. Age, thirty-five. A medium-sized woman, has always been in good health until last summer, when she had a miscarriage at the fourth month. She is the mother of two healthy children—one ten, the other five years old. At the first confinement she was waited upon by a midwife. The labor was long and hard but terminated spontaneously; it was followed by a profuse hemorrhage. Convalescence was slow. At the patient's request the midwife made a careful examination and reported that there was no tear whatever. Dr. Garvin attended her during the second confinement. He reported a labor of moderate severity, which was delayed by a band stretched in front of the head. This was pushed to one side and the labor terminated spontaneously.

Nothing of moment was discovered outside of the pelvis, except a well-marked hyperplastic appendicitis. A pelvic examination showed that the body of the uterus was in a second degree of retroflexion, considerably larger than normal, being some 5 inches in its lateral measurement, and nodular in outline. The ovaries were enlarged and movable. The perineum was only a skin perineum, there being apparently a tear extending upward on the left side of the vagina. On making a vaginal exami-



nation, a large, firm band was found, extending from the anterior wall of the cervix to the posterior wall of the vagina,  $\frac{3}{4}$  inch wide and 1 inch or more long, with a slit in the center of it.

Under surgical anesthesia it was easy to demonstrate two scars extending upward from the introitus vaginae to the band previously mentioned, one on the posterior vaginal wall and one on the anterior. The scar on the anterior wall was slightly elevated. On grasping this with the forceps and making traction, it was easily brought down to the posterior scar, from which it had been originally torn, thus restoring the former condition and demonstrating that there were two vaginae, of which the left was the smaller. The rugae of the vagina also furnished corroborative evidence, those of the right side being much larger than the left, and continuous with those on the anterior wall of the vagina; while the rugae of the left side were interrupted at the perpendicular scars.

The cervix was elongated laterally, but the edges were smooth and unbroken, although on palpation there was the feel of a slight laceration. The os was  $\frac{1}{2}$  inch in length, elliptical in shape, with the convexity directed forward, due to the fact that the cervical septum had been torn from the anterior cervical wall, and had partially retracted into the posterior wall of the cervix.

The manner in which the septal tears occurred furnishes a good illustration of the direction in which the forces of labor act in the planes of the pelvis. In the body of the uterus the septum tears in the middle, in the cervix the septum is torn from the anterior wall, but in the vagina from the posterior.

On exploring the cavity of the uterus, the probe, after being carried straight in for 3 inches, could be diverted laterally either to the left or right, to as much as an angle of forty-five degrees from the perpendicular axis of the uterus, and could be carried to a distance of 4 inches on the right side, and  $4\frac{1}{2}$  inches on the left. There was no septum present, as the probe could be swept from one side to the other, without obstruction. This demonstrated that the cavity of the uterus was of normal dimensions, from the front backward, but very much increased from side to side. From this examination it seems to me quite evident that there had been originally a corporeal septum that had been torn through, thus throwing the two uterine cavities into one large cavity. Later, when the abdomen was opened, it was again demonstrated that the uterus was but slightly larger than normal, from before back; but it was 5 inches across the fundus from one tube to the other, while on the fundus there was a marked depression with a median raphe.

The operation consisted of an ablation of the appendix, a resection of the cystic ovaries, a myomectomy of the small fibroid on the anterior of the uterus, a dilating and cureting and a Tait's perineorrhaphy. The patient recovered.

The special dangers of the double uterus are: Multiple pregnancies, with their attendant dangers and sequelæ, among the 330 cases there were twins thirty-nine times and triplets twice; also ten cases of rupture; for with a double uterus the danger of rupture is greatly increased, especially since one uterus is frequently undeveloped. Where the two uteri are more or less widely separated, the other becomes a source of danger when the one is impregnated. Forty per cent. of the very few Cesarean sections reported were for this complication.

The presence of the vaginal septum is not only liable to be a hindrance to coitus, as reported by Goodell, but, at the time of labor, it is frequently the cause of great delay or more serious consequences. Lane, Baird, Culpin, Milligan and others report cases in which it was necessary to cut the obstructing band caused by the vaginal septum, while Hadley reports a case of pregnancy in the right uterus, rupture of the septum and delivery through the left vagina. When a vaginal septum is discovered prior to the onset of labor, it should be divided; if it is not discovered until the actual confinement, it will be an added reason for resorting to Cesarean section should there be serious delay to the oncoming head. In view of the frequency of protracted labor caused by the septum, and of such serious complications as severe hemorrhage, extensive laceration, puerperal sepsis and rupture of the uterus revealed in the literature, we are led to believe that our literature of the future will show an increasing resort to Cesarean section early, in cases of double uterus and vagina.

This brings us to the subject of Cesarean section and double pelvic generative organs. I find in the literature ten of these operations performed upon double uteri, but in only three of the cases was the vagina also reduplicated.

The first of the three was reported by Lyle in 1904. Patient, thirty-one years old, three abortions followed by prolapse. Cesarean section at full term, because of complete obstruction of the pregnant uterus by the other half which was fibromatous. Double uterus and vagina present; operation completed by supravaginal amputation; both mother and child did well.

The same year Johnson reports a similar case of double uterus and double vagina. After four abortions and two destructive operations at full term, a Cesarean section of the right uterus at full term was performed with a hysteromyomectomy of the left.

Early this year Benthin reported the third case: A young

woman, twenty-two years of age, was treated for retroflexion of uterus in 1910, when it was found that she had a double uterus and vagina. A year later, at confinement, transperitoneal Cesarean section was done, with the patient's complete recovery.

To these three cases of Cesarean section in double uterus and double vagina I wish to add a case occurring in my practice.

*Case of Cesarean Section in Double Uterus and Double Vagina.*—Mrs. A. Referred by Dr. Garvin. Age, thirty-two years. Primipara. Usually in good health, was exceptionally well while pregnant. She has two brothers, aged forty and twenty-four years; four sisters age twenty-nine, twenty-seven, twenty and eighteen years. Two sisters died, one at ten years, of rheumatism of the heart, and one at four years of scarlet fever. The older brother has three children; the two older sisters have two children each; the two younger sisters are unmarried. No abnormality of any kind has been known to exist in the family. She menstruated first at sixteen and one-half years; always had a moderate dysmenorrhea, was never very regular, never ahead of time, usually late a week or more, menstrual period preceded by a week of pain. She had no idea that there was an abnormality of development such as was discovered by Dr. Garvin at the time of the confinement.

Labor pain began December 31, 1911, and the water broke after some twelve hours of pain; following this, for a period of three days the pains were only moderate, but on January 3, at 2 P. M., they became severe and continued so until the evening of that day. Dr. Garvin discovered a septum in the vagina, with a cervix on each side of the septum, the pregnancy being on the left side. No progress was made in labor. I was called in consultation at 5 P. M.; at this time the pains were very severe, so much so that we feared uterine rupture.

On examination the os was found to be undilated, although it easily admitted the finger; the head was high, but firmly impacted in the pelvis; the bladder distended, and we were unable to catheterize, so firmly was the head impacted. The pelvic measurements were those of an *equilibreo justo minor* with a *conjugata vera* of about 9 cm. Her temperature and pulse were normal. The fetal heartbeats and motions were vigorous.

An immediate operation was decided upon, and the patient was removed to the German Hospital. When she was thoroughly anesthetized, catheterization was again attempted, but in vain. The technic of the high Cesarean section was now carried out. On incising the uterus, it was found we had placed the incision over the middle of the placenta; this seemed to make no especial difference, as the child was crying lustily within ten minutes.

After removing the placenta and membranes carefully, examination proved that the uterus was double, with a rupture of the septum between the two cavities. This rupture occurred at the thinnest place, in the middle of the septum; even here it

was a quarter of an inch thick. Through this rupture the false decidua were removed from the right uterine cavity, the fetus occupying the cavity on the left. The tubes were normally implanted, one at either side of the fundus. There was no cleft in the uterus itself, but a raphe running the entire length of the uterus was plainly discernible upon the surface.

At the close of the operation there was no difficulty in catheterizing the patient. On the second day after, she had an acute dilatation of the stomach, but no rise of temperature. A bacteriological examination of the uterine discharge taken from the region of the cervix, showed a mixed infection of the staphylococcus and colon bacillus, with a preponderance of the colon bacillus. Following gastric lavage and an injection of the mixed vaccine, relief was immediate, and convalescence uneventful.

Prior to her leaving the hospital, careful examination was made to ascertain postoperative conditions: the cervix on the right side presented the features of an unimpregnated cervix; the one on the left corresponded to an ordinary cervix two weeks after delivery; it was considerably larger than the cervix on the right, somewhat dilated, and in it was a very small lateral tear. The left vagina was possibly a trifle larger than the right, though not much. Both cervices lay comparatively close to the median partition.

On the fourteenth day following the laparotomy, mother and child went home in the best of condition.

These cases just reported are instructive, not only because of their anatomical rarity and developmental interest, but because they emphasize the fact, that the especial dangers of the double uterus and vagina can be largely overcome by a careful study of the case, and skilful application of really modern, surgical obstetrics.

CITIZEN'S BUILDING.

## POSTOPERATIVE ACUTE DILATATION OF THE STOMACH.<sup>1</sup>

BY

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Des Moines, Iowa.

THIS is a condition, a complication, and not a disease. I have endeavored to exhaust the literature on the subject, published since the article of Loffer, appearing in the early part of 1908, in which he gives the findings or conclusions based on 217 cases reported up to that time. These recent articles are sixty-eight in

<sup>1</sup>Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists, Toledo, Ohio, September 17-19, 1912.

number, closing with June of this year, and have been contributed by both American and European authors.

I am sorry that time would not permit me to make any personal experiments to verify the truth or prove the falsity of the claims and conclusions gathered from these observers. I sincerely trust that the title and body of this paper shall not lull the conscience of any physician to a sense of individual security in the thought that acute dilatation of the stomach alone concerns the surgeon, and is only a postoperative condition. It is not only *not* a rare condition, but it is probably quite as frequently met with by the general practitioner as by the surgeon, and it may be encountered as a complication often far more grave than the original malady, in all forms of injuries, after nervous shock of various kinds, in all acute infections, prolonged and debilitating diseases, as well as acute indigestion, and may occur at any age and without sex preference. It has been known to follow operations after all kinds of general, spinal and local anesthesia, and following operations in which the stomach had been thoroughly irrigated.

*History.*—Rockitansky described the condition in 1842. He thought it was due to duodenal compression by the mesenteric root. Brinton recognized it in 1859 and believed it due to paralysis.

*Etiology.*—Certain conditions, recognized postmortem, have been proposed as undoubted causes of this condition. So varied and contradictory or inconstant have been some of these that most authorities have been forced to the conclusion that not one constant but many possible factors may operate and present varying degrees of importance in different cases. It is certain that paralysis of any part of the intestinal tract is promptly followed by rapid dilatation of that section, and that no demonstrable obstruction is needed at either end of the paralyzed section to prevent the accumulation of gas or fluid from escaping. It seems equally true that paralysis of the stomach and part of the duodenum will also in many cases lead to rapid dilatation of the stomach, at times even to the point of rupture, without there being any point of obstruction more than would exist from the normal power of the sphincter-like tonicity of the circular fibers of the pylorus and cardia, plus that which naturally results from the orificial displacement due to the dilatation. With the dog or cat under profound anesthesia the stomach may be distended until the respirations grow labored, heart feeble

and rapid, and dissolution appears imminent; rupture of the stomach occurs or death takes place. But if either the stomach of the dog or cat is unduly distended, when narcosis is not profound, the animal relieves itself by emptying the stomach, and every experienced anesthetist has noted the tendency of a loaded stomach to empty itself under partial anesthesia, but he has also noticed that all vomiting is at once stopped when profound narcosis is attained and no vomiting can again occur until the individual has partly, at least, recovered from the anesthetic. In fact, the anesthetist can have no surer sign that his patient is passing from under the anesthetic, or that he has not been under it completely, than when there is retching or vomiting. These facts prove very conclusively, either that the stomach is paralyzed by the anesthetic, that the vomiting center is paralyzed, or that reflex inhibitory influence has resulted in muscular paresis, and this again at once paves the way for fermentive activity and gas formation from food or other gastric contents, bacterial toxic invasion of the tissues and rapid distention of the stomach which may easily get under considerable headway during a protracted operative procedure. Within a few moments or hours under favorable conditions, such a quantity of gas or fluid may accumulate in the stomach as to distend the stomach and displace all the intestines downward, while the stomach occupies the entire abdomen, interferes with the heart's action by upward pressure and may produce rapid death or grave symptoms without any real obstruction either at the cardia, pylorus, or in the upper intestinal tract. When moderate distention of the stomach takes place the displacement may so press the root of the mesentery where it crosses the third part of the duodenum, as to completely stop all egress downward of gas or fluid so that pancreatic, duodenal and biliary secretions after distending the duodenum are poured from this overdistended organ through the pylorus into the stomach. These secretions are decidedly irritant and even corrosive to the gastric mucosa, and reinforced by the irritating properties of the anesthesia, now also being eliminated by way of the stomach, a powerful exosmosis sets in which in some cases rapidly drains all the available fluids from the body into the stomach. Regurgitation usually occurs rather than real active vomiting, for it is brought up in mouthfuls, often without effort, and without nausea in some cases, and practically always free from feculant odor. The stomach



losses in this way are often much like the overdistended and parietic urinary bladder overflow and is well expressed by the term regurgitated rather than vomited. To these possible etiological factors which may act to cause acute dilatation must be added all debilitating, and toxic agents of the septic infection type as well as those of ordinary narcotic influences, among which latter the anesthetic must not be ignored. The following sequence must then present itself in cases of this class:

1. Paresis of the stomach, vomiting center or inhibition through nerve connection.
2. Dilatation.
3. Increased obstruction at the cardia and pylorus as well as through traction upon, and angulation of, the stomach orifices and compression at the duodenal mesenteric crossing.
4. Peristalsis will also be found entirely absent in nearly every case.

Mac Evitt says the stomachs of dogs can be distended to bursting during anesthesia, but not otherwise.

Fairchild says that whatever may cause paresis may cause dilatation of the stomach. He also gives the three principal causes, namely,

1. Toxic (neuro-paralytic).
2. Gastro-mesenteric ileus.
3. Peritonitis.

*Symptoms.*—Vomiting, usually of the regurgitant type, thirst, inordinate and uncontrollable, moderate pain in some cases, sensation of fullness in the epigastrium, temperature usually but slightly elevated and at times normal. Inspection shows distention of the upper abdomen, slight or no evidence of peristalsis, tympany often very extensive and may in the dorsal decubitus extend over the entire abdomen with slight dulness noted only when percussion is made low laterally with the patient turned on the side. Splashing can be noted readily in some of the cases. In rapid distention grave disturbance is quickly noted in restlessness, dyspnea, rapid pulse becoming feeble and thready, urine very scant—the urine is so small in amount as to cause at times error in diagnosis under the supposition that the patient is dying from suppression, with uremia. The amount of fluid poured into the stomach and regurgitated is at times enormous and far in excess of the amount ingested. The vomited fluids are dark greenish, brown or almost black, sour smelling but not feculent, although presenting some ferment-

tive odor. Constipation is the rule and in some cases collapse comes early and is profound.

*Diagnosis.*—Diagnosis is always easy to one who is on the lookout for the condition and will make careful examination of the case. Persistent vomiting of the regurgitant type especially coming on after the anesthetic nausea is past and in the absence of severe local pain, rigidity of the abdominal walls or local tenderness, especially when accompanied by marked distention of the upper abdomen, becoming general with intense thirst, great prostration, rapid pulse, often without evidence of peritonitis or marked rise of temperature and accompanied by progressively increasing dyspnea, is almost an unmistakable complex of indications of acute dilatation of the stomach. Passing a stomach tube will at once prove or disprove the diagnosis by drawing off the accumulation of gas and fluid, following which if the stomach be washed until the fluid returns clear, relief of all the symptoms subjective and objective renders the diagnosis certain.

*Pathology.*—The postmortem findings are so inconstant and variable that one may say that it has no pathology except that of dilatation of the stomach. The dilatation varies from a moderate degree, extending to or beyond the umbilicus, to complete filling of the abdomen and collapsing of the other hollow viscera, or displacing the small intestines into the pelvis. Accompanying this extreme distention, there will frequently be encountered yielding of the muscular coat in different places, various changes in the mucosa and a decidedly anemic state of the stomach as a whole. The distention of the stomach has in probably 20 per cent. of the postmortem cases extended into the duodenum to the point where the superior mesenteric artery crosses the third part of the duodenum on the anterior surface of the body of the second lumbar vertebra. This postmortem findings caused some observers to conclude that the mesenteric root crossing the duodenum was the primary cause of the obstruction and the dilatation of the stomach, when really obstruction at this point never could or would have occurred save by strong traction on the mesentery or direct pressure of the dilated stomach until the resistance to the passage of gas and fluid was greater at this point than at the pylorus. Undoubtedly stasis in both the stomach and duodenum favors bacterial invasion. All experience and experimental work proves that when any part of the intestinal tract is paralyzed, distention of the part is rapid,

tissue bacterial invasion probable and angulation quickly prevents the passage of gas from the distended into the healthy part. The stomach behaves exactly the same way save that obstruction by angulation is not so complete or easy, though it is entirely sufficient in many cases at both the pylorus and cardia to prevent the passage of gas on account of the sphincter-like action of the circular muscular fibers at both orifices until the tension is so great that the pylorus yields in 20 per cent. of the cases. The cardiac orifice also permits the passage of some gas or a mouthful of dark brown or greenish fluid and at times a very large amount may be so expelled. When the dilatation succeeds in forcing the pylorus, then the gastric and pyloric contents will mingle to the point where the mesentery crosses the duodenum. The distention will not be likely to pass this line because the duodenum is normally flattened out on the anterior surface of the body of the second lumbar vertebra, the mesenteric root crossing the front of the gut with its sharp edge pressed firmly against the intestine, and held there by the new enormously distended stomach, into which is constantly being poured the outward osmotic flow from the body fluids. The fermentive changes manufacture more and more gas which in turn increases the stomach distention and the force with which the small intestines are pressed downward lower and lower into the abdomen or pelvis, pressing the root of the mesentery directly and by traction against the duodenum. The duodenum cannot yield posteriorly because of its contact with the spinal column, besides every particle of additional distention of the stomach also increases the direct stomach pressure against this same point, making egress of gas or fluids by this route an impossibility unless the stomach can be lifted forward to relieve tension on the transverse duodenum and the root of the mesentery. It has been proven by experiment that in these cases where distention produced obstruction at the mesentery crossing, as soon as the finger was passed behind the stomach and it was lifted forward so as to remove the direct stomach pressure on the duodenum, if the mesentery was not being forcibly drawn downward, the duodenal and stomach contents rapidly drain through into the small intestines. These incontrovertible facts prove conclusively to my mind that as a primary causative and obstructive factor in acute dilatation of the stomach, the crossing

of the root of the mesentery over the transverse part of the duodenum must be abandoned. How much of the pathology noted postmortem in the gastric mucosa is due to fermentation, irritation and corrosive action of the pancreatic juice entering the stomach can as yet be only conjectured. The distention is at times entirely gaseous and on passing the stomach tube gas and fluid is occasionally expelled with almost explosive force. The stomach being distended must yield at points of least resistance. The lesser curvature is short and its extremities more or less fixed by the cardia and pylorus with the resisting hepatic and diaphragmatic dome limiting displacement upward, so that as the dilatation continues the greater curvature is finally pressed against the abdominal walls at all points, while the lesser curvature is folded as it were, or more properly angulated as some observers have noted it, in the form of a "V" or "U." The folding together of the lesser curvature aids in traction upon and semiobstruction of both the cardiac and pyloric orifices. The contents of the stomach, while mostly gas, have been known at times to consist of two gallons of fluid. Liver, gall-bladder, pyloric and other adhesions as well as drainage tube or gauze pressure or drainage reflex irritation has seemed to be the principle pathology responsible for the manifestation in some cases.

Miller says "The hypersecretion from the stomach may be an effort of nature to eliminate poisons usually removed by the kidneys and liver or terminal manifestations of a grave toxemia."

Certain it is that by whatever means the bile and pancreatic juices gain access to the stomach, they at once begin an irritating and even corrosive action and possibly their presence in the stomach may powerfully stimulate the osmotic flow in all cases in which the stomach is incompletely emptied by vomiting.

The fluid itself poured into the stomach from the general system may by dilution greatly lessen this irritant and corrosive action and aid in emptying the stomach by emesis or in other words be simply another instance of nature's conservative effort in prolonging fight for life while it gives the us at the same time a very important therapeutic hint in gastric lavage.

*Prognosis.*—The mortality has been variously estimated at from 40 to 80 per cent. There is little question but that the early diagnosis and prompt use of the best recognized treatment will give a greatly reduced mortality. The very severe cases

will sometimes die within a few moments to five hours, while the less severe may linger from ten to twelve days. From whatever cause extreme dilatation of a viscus occurs, there must result more or less paresis for some time thereafter and this should forewarn us to not permit extreme redistention for fear that the paresis of distention may itself cause permanent loss of tone. This is doubly important in cases of the class under consideration where paresis undoubtedly played the most important rôle in the development of the trouble. It would therefore appear that in early emptying of the stomach and preventing its refilling there would be presented the first prognostic indication. The cases which present a high temperature from the start will give the greatest fatality because the septic intoxication which produced the pyrexia has also caused the paresis which in turn caused the acute dilatation of the stomach and the removal of the stomach contents may not be able to even slightly influence the septic process which was the primary cause. Those cases, on the other hand, which have a slight temperature rise or none until the dilatation of the stomach is very pronounced, may have had the paresis produced by a nervous shock, a blow on the epigastrium, fracture of the spine, paresis of the pneumogastric or its ganglionic center, reflex irritation from operative trauma to the solar plexus or be produced by pressure from drainage. Elimination by the stomach mucosa of ether or other toxic agents may cause or aid in causing the local manifestations, to say nothing of the almost unlimited number of debilitating causes, including indigestion from dietetic indiscretions. It will at once appear that the ability to recognize the cause and promptly to remove the same will have much to do with determining the prognosis and also that statistics are quite misleading because of the variety of factors entering into the different cases.

*Treatment.*—Should consist first of prevention to the utmost of our ability, by the suitable preparation of the patient. The stomach and intestinal tract should be as free as possible from undigested food stuff which might by arrest of the digestive process, undergo fermentation or decomposition and cause considerable quantities of gas or produce toxemia. It is necessary to avoid too profound and prolonged anesthesia. The utmost care must be taken to minimize operative trauma and pressure or adhesive irritation to the solar plexus from drains used in the upper abdomen. Frequent change must be made in the patient's

position to one side or the other, to facilitate the passage of gas or liquids and at the same time the danger of slight gastric distention will be reduced, thus preventing the stomach from impinging upon the mesenteric root and interfering with ready passage of gas and fluids into the jejunum and possibly cause regurgitation into the stomach. The operation must be completed in the shortest possible time to reduce to the minimum the period during which the vomiting center (safety valve function) is paralyzed by the anesthetic. Exposure of the abdominal viscera must be as slight as possible. Especially dangerous is much handling, air contact and friction of all kinds, but particularly wiping the abdominal viscera with gauze. *Avoid all contact of dry gauze* with the endothelial surface of any viscera. Use only gauze in the abdomen which is wrung fresh from hot normal salt solution and placed in contact with the abdominal viscera in the gentlest possible manner. The omentum must be used unsparingly to prevent the formation of dangerous intestinal adhesions, by securing it in contact with and to cover all dangerous surfaces but always without traction, and as a graft when necessary. The utmost care must be exercised to prevent the patient from taking too much and unsuitable food for some days after an operation, because many persons have little or no digestive power for several days after taking an anesthetic. The active therapeutic indications are immediate emptying of the stomach by the tube followed by lavage until the fluid returns clear and this must be done as soon as there is stomach distention, tympanitic or dull, with or without pain, nausea, vomiting, regurgitation of fluid or belching of gas and without waiting for the pulse to be greatly increased in frequency and lessened in force, respiration embarrassed, cyanosis to be extreme or the thirst to be of the agonizing, torturing kind. This use of the tube and lavage is to be repeated as often as there is the slightest manifestation of the return of distention in the upper abdomen before any symptoms take place, because an organ recently distended and paralyzed from whatever cause, cannot recover its tone if allowed to become redistended soon, for distention frequently repeated or even once of sufficiently severe a type, may render paralysis permanent without any other associated condition. The permanent loss of contractile power from overdistention of the urinary bladder is well known and there does not seem to be any good reason to con-



sider the stomach an exception. The stomach tube therefore may be needed every thirty minutes to six or eight hours.

I am sure that we erred in our first case in not passing the tube several times instead of once and by allowing ourselves to be lulled to a sense of security by the slight discomfort of which the patient complained; slight distention, absence of vomiting and ease with which she expelled and eructated gas. The grave condition of these patients of itself bars out of consideration the undertaking of such operative procedures as sectioning the duodenum and reuniting it in front of the root of the mesentery (F. Byron Robinson), gastrojejunostomy, gastrotomy, etc., even though they offered any prospect of benefit more than the use of the tube, which they do not. For the condition has occurred in cases in which gastrojejunostomy had previously been done and only one case in about every five presents obstructions of any part of the duodenum. It is very doubtful if the obstruction noted in any of the 20 per cent. of cases had anything to do with the production of the condition, but the evidence is almost indisputable that in this percentage in which the obstruction was noted, it was a result of the dilatation and in no sense a cause. Hence, though these operative procedures represented no gravity, they would still be a waste of time and absurd therapeutic measures. Normal salt, hypodermoclysis or continuous drop method enemata to replace the fluids lost by the rapid osmotic outflow through the stomach, are imperative in most cases. Hypodermoclysis must be used in all cases in which there is also inability to retain enemas or in which there exists diarrhea or frequent passages of gas per rectum, as occurs in some of these cases. The terrific thirst is one of the most urgent indications for the use of hypodermoclysis or proctolysis to relieve the starving tissues. The mechanical interferences with the heart and respiratory functions is at times very great and the stomach tube gives the only sure, safe and instantaneous relief to both. The fact that death may be almost instantaneous or occur after two weeks, only emphasizes the need of promptness and thoroughness in the use of the tube. Whether any benefit may be obtained from the use of acids, alkalies or antiseptics will depend upon the condition of the fluids drawn by the tube at the time of the lavage. About the only operative condition which could be considered justifiable under these conditions would seem to be the removal of drains, particularly

those in the upper abdomen where they may cause pressure, obstruction or splanchnic reflex inhibition, or for the release of adhesive obstruction. The position treatment so insisted upon (Geo. R. Fowler), probably represents more preventative than curative influence, for when the stomach has already undergone great acute dilatation the prone position is impossible and the lateral decubitus is not able to release the defective drainage points. The value of placing patients on the side early after all operations, particularly the right side, to facilitate drainage through the pylorus, and to prevent dilatation and pressure obstruction upon the root of the mesentery, cannot be questioned and by turning our patients we will do much to lessen the irksomeness and lumbar pain of the first few postoperative days. In cases with falling temperature, artificial heat must be freely applied. After the use of the stomach tube the patient may often lie on the face comfortably and empty the stomach as it fills, without difficulty, and he should not be permitted to resume the dorsal decubitus. The Trendelenburg position would seem to favor rather than overcome reversed peristalsis and the same is true of the knee and chest position though the latter, like the prone position, is impossible with many of these cases.

The use of strychnin, heroin, eserine or other drugs should be to meet the symptomatic manifestations as they arise in each individual case and according to the judgment of the physician.

#### CONCLUSIONS.

First, failure of the cardiac orifice to readily yield is the one essential to acute dilatation of the stomach.

Second, motor paralysis of the stomach, whether due to central or peripheral paresis, to inhibition through the solar plexus and splanchnic stimulation, or any narcotic or toxic agent, may cause the condition.

Third, reflex inhibitory influence is well shown by failure to produce dilatation of the stomach from ligating the duodenum alone, but to ligate the duodenum and crush the testicle in dogs promptly causes dilatation of the stomach.

Fourth, the greater frequency of the condition following surgery of the upper abdomen, in which wick and other drains are used, indicates the importance of inhibitory influences of the solar plexus, trauma and irritation.

Fifth, knowing that paralyzed bowel is obstructed bowel and peristalsis can alone obliterate kinks due to paralysis, we should not expect the stomach to be subject to different laws.

Sixth, on whatever side of the cardia the gastric muscularis is weakest, the dilatation will be greatest, causing the cardiac opening to be pushed to the opposite side and more or less angulated against the sharp margin of the cardiac opening in the diaphragm, thus adding another factor of difficulty in emptying the stomach by vomiting.

Seventh, operative absurdity is at once indicated by the impossibility of draining a paralyzed stomach into a paralyzed gut, and a considerable part of the intestinal tract may be expected to be paralyzed in every case of acute dilatation of the stomach by the same cause which produced the gastric paresis and paved the way for dilatation.

Eighth, the permanency of acute dilatation of the stomach will depend upon the cause operating to produce the paresis and upon the degree of distention.

Ninth, acute dilatation of the stomach sometimes occurs and progresses rapidly during an operation.

Tenth, as only a few drops of ether in the stomach may cause great dilatation, it is necessary to prevent the patient from swallowing ether.

Eleventh, acute dilatation of the stomach may begin when the small intestines are very much distended with gas and not yet parietic.

Twelfth, occlusion by the root of the mesentery must be secondary else the tube and lavage would not afford relief. The need of vigilance must not be relaxed in any period of life as the condition has been encountered at nine months and at seventy-four years of age. In all cases the stomach tube must be at once passed as it represents no danger and its early and thorough use gives almost the only hope of cure.

Thirteenth, it is so easy to detect the first manifestations of acute dilatation of the stomach by touch that I am convinced that at every visit for the first few days after an operation the surgeon should pass the hand down over the ensiform cartilage and note whether there is distention of the epigastrium and when it is detected he should pass the stomach tube at once and prevent grave complications. This precaution is especially important in abdominal cases and interns as well as nurses should be

taught the importance of this sign of fullness in the epigastrium in order that danger from acute dilatation of the stomach may be at once detected and dealt with in time, even though the surgeon may not be present, because of the extreme rapidity with which it may develop into a condition of the utmost gravity.

The average age of the patients reported in this list is thirty-seven years, the oldest being seventy-one and the youngest two and one-half. The report includes the work of forty-two operators, eight cases being the greatest number reported by one operator. The two cases reported by the author were encountered within the last year. The sex was given in eighty-five of these cases, with twenty-six males and fifty-nine females. The anesthetic used is mentioned forty-one times and in the following number: Ether, twenty-seven; chloroform, seven; scopolamin-morphin-ether, two; ether and chloroform, two; hyosin-morphin-chloroform, one; nitrous oxide, one; gas and oxygen, one. This includes nine gastroenterostomies and twelve appendectomies. The justifiability of undertaking to cure acute dilatation of the stomach by gastroenterostomy and the obstructive influence of the root of the mesentery as a causative factor in producing acute dilatation of the stomach is nevertheless emphatically denied because in every case the gastrointestinal anastomosis was made beyond the mesenteric root crossing of the duodenum. The operative time is given in only twenty-two these cases and it slightly exceeds one hour.

It would be interesting to know what was the operative time on many of these other cases because of its undoubted influence in the production of acute dilatation of the stomach. In twenty-two cases the symptoms of acute dilatation of the stomach were manifested within twenty-four hours after operation, in forty-one the first symptoms appeared from the fourth to the sixth day and in one case the onset was delayed to the sixth week. In cases so long delayed in their onset as six weeks, one must always look for a cause, as dietic error, nearer in time to the manifestation than that of the operation.

In this list there were sixty-one recoveries and thirty-nine deaths, or a mortality of thirty-nine per cent. In sixty-seven of these cases the stomach tube was used, usually accompanied by lavage. Of the sixty-seven thus treated, there were forty-seven recoveries and twenty deaths, or a mortality of a little over 29 per cent. If we exclude from this last list, eight cases in which the acute dilatation was complicated, in some by general

peritonitis, septicemia, erysipelas (the latter given as the cause of death in one case) and one case in which the operator admitted the probability that acute dilatation of the stomach existed at the time of operation, the mortality of those cases of uncomplicated acute dilatation treated by the passage of the stomach tube, is reduced to less than 18 per cent.

We have reason to believe that this mortality will be still farther reduced when the diagnosis is made earlier and the stomach tube and lavage are persistently and intelligently used.

The eleven cases reported by Boice, Littig, Osborne and Ruth, have not been previously reported or published.

Three of the reported cases should have been excluded as not strictly deserving a place in an article on postoperative acute dilatation of the stomach, but I have allowed them to remain because they contained important suggestions or data. Hendon mentions having had three other cases which he did not report. These would bring the entire number up to 100, after excluding the three cases not properly belonging in this series. Hendon's unreported cases, however, would still further reduce the percentage of mortality because all three of his unreported cases recovered.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(1) Axhausen.....	41	Male.....	.....	Posterior gastrojeju- nostomy.	.....	11th day.....	Four days later (15th day) relaparotomy was done and the adhesive obstruction which was present was re- moved. The distal con- tracted intestine at once filled.	Recovery prompt and com- plete. Gained 5 lb. in 3 weeks.
(2) Axhausen.....	41	Male.....	.....	Gastroenterostomy.....	.....	11th day.....	Five days later (16th day) relaparotomy was done. Found a tubercular stenosis of duodenum. Excision of stenosed portion of gut was done.	Convalescence disturbed for 10 days following operation by local peritoni- tis. Condition cleared up with recovery.
(3) Barker.....	40	Female.....	.....	Posterior gastrojeju- nostomy for duo- denal ulcer.	.....	1st day.....	Stomach tube every 3 to 5 hours—12 quarts of liquid and much gas removed in 16 hours—Prone position used.	Improvement for 5 days. Death on 18th day, due to peritonitis.
(4) Barker.....	40	Female.....	.....	Appendectomy; pos- terior gastrojejunos- tomy.	.....	10th day.....	Repeated lavage.....	Died on 17th day.
(5) Blain.....	57	Female.....	Ether.....	Exploratory lapar- otomy.	.....	3d day.....	Stomach tube passed 14 times in 24 hours.	Recovery in 15 days.
(6) Blain.....	29	Male.....	Ether.....	Appendectomy.....	30 min.	2d day.....	Lavage of stomach done 11 times.	Recovery in 15 days.
(7) Blain.....	.....	Male.....	.....	Appendectomy.....	.....	3d day.....	Lavage was repeated several times.	Prompt recovery.
(8) Blain.....	.....	.....	.....	Epidural tumor of the lumbar cord.	.....	6th week.....	Tube and lavage used for 10 days.	Recovery.
(9) Blain.....	34	Female.....	Ether.....	Salpingectomy.....	.....	3d day.....	Stomach tube drew 2 quarts of bile-colored fluid.	Recovery without further trouble.



## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(10) Blain.....	.....	Female.	.....	Inversion of the ap- pendix, and ovari- ectomy.	.....	6th day.....	Tube drew 2 quarts of brown fluid.	Died on 13th day.
(11) Blain.....	.....	Female.	.....	Ovariectomy for cyst.	.....	3d day.....	Lavage repeated 3 times....	Recovery in 12 days.
(12) Blain.....	28	Female.	.....	Alexander operation on the round liga- ments.	.....	5th day.....	Lavage was done 5th and 6th days.	Recovery.
(13) Boice (C. A.)*	58	Female.	Ether..	Abdominal hysterec- tomy.	100 min.	3d day.....	Lavage gave immediate re- lief.	Death in 18 hours from onset of symptoms—no autopsy.
(14) Boyd.....	.....	Female.	.....	Induced abortion for pernicious vomiting.	.....	6 hours.....	.....	Died in 10 hours.
(15) Boyd.....	.....	Female.	.....	Perinephritic abscess.	.....	2d day.....	.....	Died in 24 hours.
(16) Boyd.....	25	Male alcoholic	Chloro- form.	Ilgual adenitis....	.....	3 hours.....	Tube was passed the 3d day..	Died. (Diagnosis was made only a few moments before death—at which time stomach tube was passed.)
(17) Boyd.....	2 1/2	Female.	.....	Ill two days with re- gurgitant vomiting.	.....	.....	Repeated lavage.....	Death occurred on 8th day.
(18) Boyd.....	38	Male.....	Chloro- form.	Cut in a brawl.....	.....	17 hours.....	.....	Died in 48 hours. Stomach was distended with fluid and gas. Pyloric kink present.
(19) Callender.....	.....	Female..	Ether..	Salpingoophorec- tomy.	45 min.	36 hours.....	Repeated lavage.....	Death occurred. Post- mortem findings showed a general peritonitis and extensive adhesions to the stomach. Pulse at- tained a rapidity of 160 within 36 hours.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anesthetic	Operation	Time of operation	When symptoms appeared	Treatment	Results and remarks
(20) Callender....	.....	Female..	.....	Ventral suspension....	.....	8 hours.....	Repeated lavage. Patient placed in lateral and prone position.	Died 8 days later from erysipelas.
(21) Callender....	.....	Female..	Ether ..	Hysterectomy for fibroid.	.....	2d day.....	.....	Died 4th day. Stomach reached 6 inches below the umbilicus. No peritonitis. Pulse 4 before death.
(22) Chavannaz...	49	Male....	.....	Posterior gastro-enterostomy.	43 min.	Vomiting 2d day dilatation 4th day.	Frequent lavage—hypodermoclysis.	Recovery—gained 7 kilos at end of 6 months.
(23) Chavannaz...	49	Male....	Chloroform.	(?) performed 6 1/2 months after above operation.	.....	2d day.....	Lavage.....	Recovery.
(24) Cowntt.....	26	Female..	.....	Appendectomy.....	.....	3d day.....	Stomach tube used 3d day—much gas and liquid expelled.	Recovery.
(25) Delageniere...	42	Male....	Chloroform.	Laparotomy for ruptured intestine—drainage at 2 points.	.....	Vomiting 2d day marked dilatation 3d day.	Lavage removed large amount of liquid—repeated every 3 hours. Ventral position 3 days. Hypodermoclysis.	Recovery in 20 days.
(26) Delageniere...	62	Male....	.....	Herniotomy.....	.....	Enormous dilatation in 24 hours.	Lavage; intestinal lavage; genpectoral position; ventral position gave immediate relief; hypodermoclysis.	Recovery in one month.
(27) Delageniere...	25	Male....	.....	Appendectomy and nephropexy.	.....	Vomiting 2d and 3d day.	Purgation; lavage used.....	Death on 4th day. Autopsy showed enormous dilatation of stomach—no peritonitis.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anesthetic	Operation	Time of operation.	When symptoms appeared	Treatment	Results and remarks
(28) Eskridge, . . .	32	Female.	Scopolamine, morphine, and ether.	Appendectomy; dermoid cyst removed.	60 min.	48 hours. Temp. 100, pulse 120	Lavage repeated every 3 1/2 hours.	Recovery.
(29) Eskridge . . .		Female	Scopolamine, morphine, and ether.	Appendectomy and ovariectomy.		30 hours. Pulse 118.	Repeated lavage.	Died on 4th day.
(30) Fairchild . . .		Female.		Ovariectomy . . . . .		7th day. Temp. 102. Pulse 124.	Stomach tube and lavage gave immediate relief.	Recovery.
(31) Friedman reports case—(Hammerberg, operator)	22	Male	Ether and chloroform	Appendicitis.			Lavage . . . . .	Death one week later—no autopsy.
(32) Grandin . . .		Female.		Total hysterectomy . . .	60 min.	12 hrs. with tympany.	Tube drew a quart of dark fluid every 2 hrs. (Patient had taken only a few ounces of fluid.)	Recovery.
(33) Grandin . . .	42	Female.		Supravaginal hysterectomy for fibroid and pregnancy.	60 min.	24 hrs. with tympany (sort of bubbling).	Tube drew 2 quarts of fluid lavage every 2 hrs.	Died in 30 hrs.
(34) Hildendall . .	35	Female.	Chloroform.	Laparotomy for pyosalpinx.		Evening of 4th day. Pulse 140. Green vomit on 5th day. Profuse vomiting on 6th day.	Transfusion for collapse . . .	(Parotitis and abdominal abscess as complications on 15th day.) Recovery.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(35) Hendon.....	.....	Female..	.....	Appendectomy and lifting of the uter- us.	.....	Pulse rapid and weak on third night.	Stomach tube drew off brownish fluid. Lavage twice daily for 5 or 6 days.	Complete recovery.
(36) Hendon†.....	37	Female..	.....	Cholecystotomy with tubal drainage.	.....	Apparently mori- bund in 48 hrs.	Tube drew several gallons of brackish fluid—second passage of tube drew off about 1/2 amount as ob- tained at former time.	Recovery prompt and com- plete.
(37) Heperline....	47	Female..	.....	Fibroma.....	.....	About 12 hrs. nauseated. Pulse 120.	Tube drew off dark green fluid; lavage every 3 hrs. for first day.	Prompt recovery.
(38) Heperline....	43	Male....	.....	Strangulated hernia...	.....	Vomiting in 12 hrs. Pulse 120. Acid fluid.	Lavage reduced pulse to 96; repeated every 3 hrs.	Recovery.
(39) Heperline....	.....	Female..	.....	Double pyosalpinx...	.....	Copious vomit- ing of dark green fluid in 24 hrs. Temp. 98 1/2. Pulse 120.	Stomach tube passed twice.	Death in 15 hrs. from onset of dilatation. Vomitus was acid and irritated the face and hand.
(40) Hopkins.....	69	Female..	.....	.....	.....	.....	.....	Died on 3rd day. Patient was subject of chronic bronchitis—had slight pain; no fever; vomitus was greenish but with- out fetid odor. Autopsy showed dilatation of stomach and duodenum to crossing of the superi- or mesenteric artery.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(41) Hopkins....	60	Male....	.....	Partial resection of stomach for carci- noma.	.....	2nd day. Temp. 100. Pulse 160. Resp. 26.	Enema secured expulsion of gas and gave some relief. Digitalin gr. 1/50, strychnin gr. 1/30, adrenalin 1/100; calomel; stomach lavage.	Died on 8th day after opera- tion; autopsy showed stomach suture line united well, but enor- mous distension of stomach to mesenteric crossing. No peritonitis.
(42) Hopkins....	10	Male....	.....	Appendectomy with- out drain—internal operation.	20 min.	15 hrs. Temp. 99. Pulse 140. Resp. 30.	Saline infusion per rectum. Morphin gr. 1/6, atro- pin gr. 1/150 (hypo). Stomach tube passed. Prone position.	Recovery.
(43) Hoskins....	60	Male....	.....	Partial resection of stomach.	.....	2nd day. Temp. 100. Pulse 160.	Digitalis and calomel were given.	Death occurred in 12 hrs. Autopsy showed enor- mous dilatation of stom- ach with presence of greenish fluid. Dilata- tion of duodenum to crossing of mesenteric root.
(44) Hoskins....	10	Male....	Ether...	Appendectomy. ....	20 min.	15 hours. Temp. 99. Pulse 120. (Rose to 140).	Second day lavage was used; patient turned on face; foot of bed elevated.	Recovery.
(45) Landahl....	13	Male....	.....	.....	.....	.....	Lavage. ....	Patient was bicycle riding until 8 p. m. On follow- ing morning temperature was 37.5° C., pulse 140, thirsty, stomach acutely dilated. Died in 10 hours.
(46) Lanphearff...	39	Male....	Hyo- scin, mor- phin and chloro- form	Posterior gastro- jejunostomy.	.....	.....	Wound was open through- out on 13th day from irradiation of stomach. Under full anæsthesia the extruded intestines were replaced in abdominal cavity and the wound freshened and sutured.	Recovery. Discharged in 24 days. Original opera- tion was performed to relieve dilatation of stomach due to cicatrix from old duodenal ulcer.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(47) Lee.....	45	.....	.....	Appendectomy.....	.....	2 hrs.....	Tube used with repeated lavage.	Recovery.
(48) Lee.....	43	.....	.....	Ventral hernia.....	.....	6 hrs. accom- panied by vomit- ing.	Stomach tube and repeated lavage.	Recovery.
(49) Lee.....	.....	.....	.....	Removal of gall- stones.	.....	9 hours accom- panied by severe pain.	Stomach tube and lavage....	Died in 52 hrs.
(50) Littig (L. W.)*	30	Female..	Ether...	Appendectomy (No pus but septic case in house at time).	.....	48 hrs. Temp. 105.	Reopened abdomen on 4th day. Withdrew fluid and gas in large amounts. Gas expelled through tube with explosive force—lav- age used.	Died on 7th day.
(51) Littig (L. W.)*	17	Female..	.....	Appendectomy (in- fection in house).	.....	48 hrs. Temp. 105.	Repeated lavage — patient cried for tube.	Died on 10th day.
(52) MacEvitt....	25	Female..	.....	Obstetric.....	.....	1 hr. after deliv- ery. Temp. 103.6. Pulse 112.	.....	Died on 9th day—no autopsy, but paracentesis of stomach removed gas and distention.
(53) MacEvitt....	29	Female..	.....	Appendectomy. Hysterectomy.	.....	2nd day worse to 4th day.	Relaparotomy (as diagnosis of obstruction was made but true condition being found stomach tube was used). Lavage.	Recovery.
(54) MacEvitt....	.....	Female..	.....	Tuboovarian abscess and pelvic peritonitis.	.....	50 hours.....	Removed fluid from stom- ach; tube and lavage used — patient placed on side.	Intestines rose out of pel- vis—stomach regained normal size and position. Recover.



## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(55) McMonagle	34		Ether					Case was an alcoholic. There was no obstruction. Died after 2 days of almost continuous regurgitation. Stomach was filled with gas and 2 gallons of fluid filled, almost the entire abdomen extending to pubes.
(56) McMonagle	20		Ether	Appendectomy. General peritonitis.		4th day	Stomach lavage.	Recovery.
(57) McMonagle	45	Female.	Ether	Hysterectomy		8th day	Stomach lavage. HCl was given as washings were alkaline.	Recovery.
(58) McMonagle	53	Female.	Ether	Hysterectomy		7th day great thirst.		Died 4th day. Enormous distention of stomach. No obstruction; organs healthy.
(59) McMonagle		Female.	Ether	Hysterectomy		5th day	Stomach lavage on 10th day.	Died 10th day. Enormous distention of stomach— infection of stump. Gen- eral peritonitis. No ob- struction.
(60) McMonagle			Ether	Removal of gallstones and gall-bladder.		10th day	Relaparotomy and removal of gas and fluid by trocar. Stomach was washed in 8 hours and fluid was clear.	Recovery.
(61) McWilliams	35	Female.	Nitrous oxid.	Appendectomy and myomectomy.	45 min.	3rd day. Temp. 103. Pulse 150.	Frequent use of stomach tube and lavage.	Recovery.
(62) Miller	27	Female.		Salpingoophorec- tomy.		24 hrs. Pulse 165.	Drew off dark liquid with tube 3 times—patient placed on side.	Recovery. Gauze drain was used in vaginal vault.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anesthetic	Operation	Time of operation	When symptoms appeared	Treatment	Results and remarks
(63) Osborn (J. W.)*	27	Female.	Ether.	Supravaginal hysterectomy.	90 min.	48 hrs. Temp. 101. Pulse 120.	Gastric lavage used once at end of 60 hrs. Strychnin sulph. gr. 1/30 (hypo) every 3 hours for 3 days. Starvation for 48 hrs., then liquid diet.	Recovery.
(64) Osborn (J. W.)*	54	Male....	Ether...	Appendectomy (with drainage).	35 min.	Nausea in 40 hrs. Vomited for next 48 hrs. at times then dilatation.	Lavage at end of 90 hrs.—repeated every 3 hrs. for 24 hrs.—then 4 to 6 hrs. for following 24 hrs. Strychnin, whiskey (man was alcoholic).	Recovery.
(65) Osborn (J. W.)*	55	Female.	Ether...	Ventral hernia....	120 min.	24 hrs. Temp. 100. Pulse 98.	Enema followed by lavage at end of 33 hrs. Enema every 3 hrs.—strychnin gr. 1/30 (hypo) every 3 hrs for 12 days.	Recovery.
(66) Osborn (J. W.)*	25	Female	Ether..	Supravaginal hysterectomy.	95 min.	Some dilatation at beginning of operation. Great dilatation in 36 hrs. Temp. 100.2. Pulse 120.	Lavage—repeated in 4 hrs. Strychnin (hypo) for a week.	Recovery.
(67) Osborn (J. W.)*	40	Female.	Ether...	Supravaginal hysterectomy.	120 min.	48 hrs. Temp. 100.6. Pulse 140.	Refused gastric lavage. Starvation—strychnin (hypo) every 3 hrs.	Death at end 90 hrs.
(68) Osborn (J. W.)*	18	Male....	Ether...	Appendical abscess...	20 min.	Probably some dilatation at time of operation. Vomited at end of 36 hrs. Temp. 101.2. Pulse 142.	Gastric lavage—normal. Salt per rectum—strychnin (hypo).	Died at end of 53 hrs. At end of enesis tempt. 100.4 F. Pulse 124.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anesthetic	Operation	Time of operation	When symptoms appeared	Treatment	Results and remarks
(69) Pilcher.....	71	Female..	Gas and oxygen.	Amputation of leg.....	.....	24 hrs. ....	Lavage every 8 to 10 hrs. Right-sided position.	Recovery.
(70) Pilcher.....	54	Female..	.....	Appendectomy and hepatojejun.	.....	Nausea and belching in 30 hrs. Regurgitation.	Stomach lavage twice daily until 6th day. Right-sided position.	Recovery.
(71) Rodgers.....	42	Female..	Ether...	Salpingoophorectomy.	.....	13 hrs. Temp. 105. Pulse 150.	.....	Died on 5th day. No pain; enormous amount vomited. Conscious and comfortable to the end.
(72) Root.....	41	Female..	.....	Salpingoophorectomy.	30 min.	30 hrs. ....	Placed on right side; later on face because symptoms returned when on back.	Recovery.
(73) Ruth (C. E.)*.	24	Female..	Ether...	Double salpingectomy suppurative (fetid).	60 min.	24 hrs. Temp. 103. Pulse 120 to 150.	Lavage; not repeated.....	Died in 24 hrs. Temperature previous to operation was 103.
(74) Ruth (C. E.)*.	54	Female..	Ether...	Intestinal obstruction from old operation adhesions.	110 min.	2d day with constant hicough Temp. 100. Pulse 146.	Stomach tube and lavage drew 1/2 gallon of dark brown liquid and much gas. Latter escaped with almost explosive force—in all 12 lavages were given. Hypodermoclysis used 5 times.	Recovery. No fecal odor to washings until 9th day. This washing showed many colon bacilli.
(75) Sherwood....	4	Male....	.....	Appendectomy (gangrenous).	.....	2d day.....	Lavage every 4 hrs. continued to 12th day.	Recovery.
(76) Sherwood....	9	.....	.....	Appendectomy (gangrenous).	.....	Projectile vomiting after 10th day.	Lavage at regular intervals. Strychnine gr. 1/90 (hypo) every 3 hours.	Recovery tedious but satisfactory.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(77) Smith.....		Female.		Double Salpingo- ophorectomy (drainage).		36th hr.....	Lavage.....	Recovery.
(78) Smith.....				Posterior gastroen- terostomy.		36th hr.....	Repeated lavage.....	Recovery.
(79) Smith.....				Cholecystotomy (drainage).		36th hr.....	Lavage repeated three times.	Recovery. No return of symptoms after removal of drain.
(80) Smith.....				Appendectomy.....		20th hr.....	Lavage once.....	Recovery.
(81) Smith.....				Appendectomy (drainage)		66th hour.....	(Not mentioned.).....	Recovery.
(82) Smith.....				Salpingectomy.....	90 min.	36th hour.....	Lavage used twice.....	Recovery.
(83) Smith.....				Appendectomy.....		4 days.....	Lavage.....	Recovery.
(84) Sommarin....	15	Female.	Chloro- form and ether	Acute dilatation of stomach with pen- dulous pylorus and cardia.			Stomach was punctured and gas evacuated with 2 liters of fluid. No HCl; slight lactic acid. Fistula made according to Nitzel with- out fixation of catheter to abdominal wall. Foot of tube raised. NaCl solution per rectum; morphine; no food for 6 days.	Recovery. Tube removed 25th day; fistula closed 28th day; two months later bismuth shadow gram showed stomach still reaching below the umbilicus. No particu- lar discomfort.
(85) Thorn.....	32	Female.		Myofibroma removed.		24 hrs. vomiting and resurgita- tion.	Tube not used. Chloral 2 drams. Potassium bro- mide 4 drams, Tinc. digitalis 1 c.c. per rectum.	Recovery.
(86) Thorn.....	32	Female.		Ovariectomy and appendectomy.		Eruption of gas in 6 hours	(Not mentioned.) Tube not used.	Died in 66 hours.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(87) Thorn.....	35	Female.	.....	Ovariectomy.	.....	Erection and vomiting in 3 hrs. with pain.	Repeated lavage.....	Died 5th day.
(88) Tissier.....	49	Female.	Chloro- form.	.....	.....	Few hours.....	Lavage gave prompt relief. As many as 5 lavages were given daily for a week.	Recovery. Vomiting which appeared early was at first thought to be due to anesthetic.
(89) Tissier.....	45	Male.....	.....	.....	.....	.....	.....	Death in 15 hrs.
(90) Tissier.....	42	Female.	.....	Hysterectomy.....	.....	2d day (p. m.) Temp. 37° C.	Ether and oil of camphor.....	Died 3d day (A. M.).
(91) Tobert.....	10	Male.....	Ether.....	Abdominal section.....	30 min.	3d day.....	Tube and lavage.....	Recovery.
(92) Telert reports case. (Groves operator)	43	Female.....	Ether.....	Supravaginal hyster- ectomy and appen- dectomy.	.....	.....	Tube was passed.....	Recovery. During opera- tion stomach was found reaching almost to pubes.
(93) Tobert.....	.....	Female.....	Ether.....	Cesarean section.....	.....	During opera- tion.	Lavage was done during operation—and after operation—patient placed on side. Repeated procto- lysis.	Recovery.
(94) Tama.....	34	Female.....	Ether.....	Ovariectomy and hematocoele.	75 min.	3d day, temp. 98°, pulse 120.	Repeated lavage.....	Recovery.
(95) Torrence.....	22	Female.....	.....	Gastrojejunostomy.....	.....	3d day.....	Lavage of stomach for 3 successive days.	Recovery in 1 month.
(96) Van der Vliet.....	17	Female.....	.....	Nephropaxy.....	.....	.....	.....	52 hrs. after operation patient seemed out of danger. Died at end of 75th hr. Postmortem measurement of stomach showed greater curva- ture 60 cm.

## CASE REPORTS ON ACUTE DILATATION OF STOMACH.—CONTINUED.

Name of operator	Age of patient	Sex	Anes- thetic	Operation	Time of opera- tion	When symptoms appeared	Treatment	Results and remarks
(97) Van der Voordt.	24	Female.	Chloro- form.	Hematocele, laparo- tomy.	.....	6th day vomiting. Temp. 36.6° C. Pulse 120, 8th day vomiting incessant.	Trendelenburg position, sub- cutaneous injections of camphor.	Recovery in 22 days.
(98) Wilkinson...	43	Male....	.....	Appendicial abscess.	.....	4th day frequent vomiting of green fluid.	Patient expired when turned on right side, 5 pints of dark green fluid expelled at this time.	Death on 5th day.
(99) Witherspoon.	32	Male....	.....	Posterior no-loop gas- troenterostomy for dilatation of stom- ach with vomiting of coffee-ground looking material (blood in stools).	.....	.....	.....	Death. Postmortem showed stomach greatly dilated but anastomosis healed and well open.
(100) Witherspoon	39	Male....	.....	Appendectomy (blood in stools).	.....	.....	.....	Death in 12 days. There was suppression of urine 3 days before death, also marked dilatation.

\* Cases not previously reported. † Hendon says that he has had three other cases which he did not report because they were simply repetitions of the others and therefore a waste of time.

†† The bibliography of the Cown and Lanphear case reports has been misplaced and therefore I am not able to present them in the regular list.



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407 EQUITABLE BUILDING.

## IN MEMORIAM.<sup>1</sup>

HENRY GIBBONS, JR., M. D.,

BY

S. H. BUTEAU, M. D.<sup>2</sup>

DR. HENRY GIBBONS, JR., a member of this Association for more than twenty years, died at his home in San Francisco, September 27, 1911, from a very rapidly advancing arteriosclerosis. He was active in the practice of his chosen profession and in lecturing until within a comparatively short time of his death, which occurred a few days after his seventy-second birthday.

He was of sterling old Quaker stock and was born in Wilmington, Delaware, September 24, 1840. He came freely into his chosen profession, for he was born and bred a physician. The influences of heredity and home environment are here beautifully illustrated by noting the professional calling of immediate members of this interesting family. The grandfather was a physician. Three of his eight sons were physicians, one of whom, Dr. Henry Gibbons, Jr., was the father of the subject of this Memorial. Dr. Henry Gibbons was the father of six children, but two of whom are sons and they, at the present time, are successful practitioners of medicine in San Francisco. In 1871 the Doctor married Miss Mary Conger Raymond, an accomplished

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

<sup>2</sup> Much of the data for this Memoriam is taken from "In Memoriam of Dr. Henry Gibbons, Jr.," published by order of the Directors and Faculty of Cooper Medical College.—S. H. Buteau.

and charming woman, who proved a devoted wife and mother. She died in 1899.

After receiving his academic education, Dr. Henry Gibbons, Jr., taught school for a few years and then began the study of his profession at the Medical College of the Pacific from which he was graduated in 1863 and at once became associated with Dr. E. S. Cooper. The practical work done under this eminent surgeon proved of value beyond measure to Dr. Henry Gibbons, Jr., later in the arduous duties of Acting Assistant Surgeon of the United States Army, which position he accepted in the strenuous days of 1864. For two years he served his country in the field or at the Douglas Military Hospital, Washington, D. C.

Returning to San Francisco, Dr. Gibbons, Jr., became associated with his father in the practice of medicine and in the editorship of the *Pacific Medical Journal*.

He received the honorary degree of Master of Arts from the University of the Pacific; was elected Dean of the Medical College of the Pacific and to the same position by its successor—Cooper Medical College. He was appointed Health Officer of San Francisco and later was made a member of its Board of Health, served as a member of the San Francisco Board of Education, was chosen Professor of Materia Medica and Therapeutics in Cooper Medical College, and later Professor of Diseases of Women and Children; was a member and president of various medical societies. Shortly before his death he was appointed Emeritus Professor of Gynecology and Obstetrics in Stanford University. These honors and responsibilities are witnesses that bear silent, but convincing testimony of the devotion of his life to professional, educational and civic uplift, and they come to him only who possesses the highest standard of qualifications.

I knew Dr. Henry Gibbons, Jr., well for more than twenty-three years. From the time I first met him, when I was matriculating as a student in the Cooper Medical College, I was impressed by his kindly nature. He was always unselfish, tolerant, sympathetic, trustful. He kept faith with himself, with men and with things through all the varied experiences of his life. With him to live seemed a special privilege. His college work and large practice undoubtedly made him the busiest physician in all the West for many years and yet he was never too busy to carry the burdens of discouraged students and young doctors, until, by the example of his own strong personality and conduct, he inspired them with the energy of cheerfulness and determina-



DR. HENRY GIBBONS, JR.





tion by which they could carry their own borders. We might all envy him his host of warm friends and yet I am sure he never tried to make a friend, he tried only to do friendly acts.

He lived in an age when science told us great truths and formulated many of nature's laws, and it was the inspiration of his life not only to apply these in his practice, but to help spread them and make them of universal knowledge. And thus we see him devoting himself at an early age to the publication of medical journals and to the teaching of medical students.

Dr. Gibbons, Jr., grew to manhood in the State of California at an early period of its history, when the great mass of its people were moved by the single ambition to quickly amass a fortune, but the humanitarian soul of Dr. Gibbons could not be influenced by such sordid environment. He expended his energy in the development of high, unselfish ideals, but he was no dreamer; he taught them by example as well as by precept. Full was his life, rich in experiences of unselfish devotion to his chosen profession and to the duties of citizenship. His was the rounding out and the development of all his human possibilities through work, and struggle, and trial.

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## IN MEMORIAM.

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GUSTAV C. E. WEBER.

BY

WM. H. HUMISTON,  
Cleveland, O.

DR. GUSTAV C. E. WEBER was born in Germany at Bonn on the Rhine in 1828 and died at his beautiful country home "Cosy Bank" on the shore of Lake Erie, near Willoughby, Ohio, at the age of eighty-four years.

Dr. Weber came to Cleveland in the year 1856 as Professor of Surgery. At that early age he was master of his profession and so rapidly did he gain a state-wide reputation and general recognition that within five years he was appointed by Governor Todd, Surgeon General of Ohio, and given special privileges by Mr. Stanton, then Secretary of War in President Lincoln's Cabinet. This early success was attained by long and diligent study and preparation under the best physicians and surgeons

in Germany, Austria and France. His associates and teachers were conducive to a high degree of attainment and this, together with his elegant physique, and most courtly manners, marked him at once as a man of remarkable capabilities.

His boyhood home at Bonn was an intellectual center where Jean Paul Richter often came. His mother was of noble birth and a woman of marked literary attainments and strong womanly qualities. His father, M. I. Weber, Professor of Anatomy, the author of several books and atlases, was a man of great renown.

Dr. Gustav Weber came to his full development in the latter sixties, when he was about forty years old, but his ripest period was from his forty-fifth to his fiftieth year. He was largely instrumental in erecting St. Vincent's Charity Hospital in Cleveland in 1863 and 1864 to take care of the wounded soldiers as they were sent north from the southern battlefields of the "War of the Rebellion." He organized a Charity Hospital Medical School and started the first medical journal in Cleveland, but did not contribute much to medical literature, as his time was wholly taken up with an enormous professional work, and the exacting demands of a wealthy clientel distributed over a wide area.

It was in 1898 that he retired from active surgical practice and became Counsel in Nuremberg, where he remained four years. When he departed for Germany he gave to the Cleveland Medical Library his books and instruments, as well as financial help.

Upon his return to Cleveland in 1903, he was tendered a banquet by the Cleveland Medical Association. It was a large representative gathering of the medical profession of Ohio and adjoining states. After Dr. Weber had delivered his address, his old friend and colleague, Dr. Thad. A. Reamy of Cincinnati arose to speak, but had hardly started when Dr. Weber was noticed sliding from his chair and became unconscious—the result of a cerebral hemorrhage that paralyzed his right side. He was tenderly carried to a room above by several doctors. He made a slow partial recovery and was taken to his country home to live in quiet and peace, under the loving care of his noble and capable wife, who for years anticipated his slightest wish and desires and made him comfortable until early this year, when an attack of influenza terminated peacefully his life.

Mrs. Weber and a married daughter, who lives in Philadelphia survive him.



DR. GUSTAV C. E. WEBER.



## IN MEMORIAM

MANNING SIMONS, M. D.,

1846-1910.

BY

CHARLES M. REES, M. D.,

DR. MANNING SIMONS was born in Charleston, S. C., May 6, 1846. His father, General James Simons was a well-known lawyer of that city and his mother, Sarah Lowndes Wragg, was of the Wraggs who had so large a share in the building up Charleston.

Dr. Simons' preliminary education was received in the schools of his home city, and at the time of the Civil War he, being too young to enter the army, was sent to the Charleston College. As soon as he was of sufficient age, however, he left college and entered the Confederate service, serving as the courier on General Hardee's staff. This was in 1863 while in the junior class. On his return after peace was declared, like many others, he felt he could devote no further time to collegiate study but must set about his life's work, and started in his study of medicine at the Medical College of the State of South Carolina. Not until 1908 was he awarded the Baccalaureate degree by the College of Charleston which at the same time awarded him also the title of Doctor of Laws in recognition of his great attainments. In 1868, he attained his degree in medicine and settled in his old home to practise.

The first years after the war were ones of great privation. The writer has often heard Dr. Simons tell of his struggles to make a living at that time and of how he added to his income by singing in church choirs in addition to his medical work. In common with most of his compatriots he was practically stripped by the war and by the subsequent reconstruction days. After a long, hard struggle he began to forge ahead and early assumed a prominent part among the medical men of his city. During these lean years his intense application and diligence laid the foundation of the great success which was his in later years.

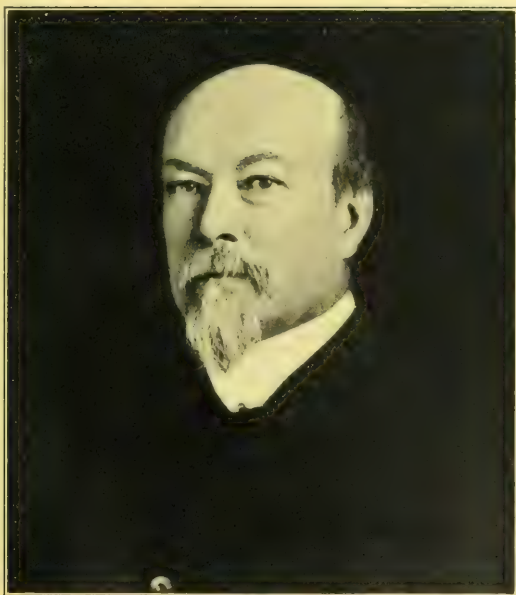


Dr. Simons began his career as a teacher of medicine early, starting in as a demonstrator of anatomy in the Medical College of the State of South Carolina. From anatomy he gravitated into the teaching of surgery and for many years filled the Chair of Clinical Surgery in his Alma Mater. Later he was made Professor of Abdominal Surgery and Gynecology which chair he filled up to the time of his death. During his life he won many honors and held many responsible positions. He was a member of numerous medical societies and a constant attendant at their meetings. Among the positions held by him may be mentioned the following:

Professor of Abdominal Surgery and Gynecology, Medical College of the State of S. C. Surgeon, Roper Hospital, Charleston, S. C. Surgeon, St. Francis Xavier Infirmary, Charleston, S. C. Surgeon, Southern Railway. Medical Examiner of Mutual Benefit and of Phoenix Mutual Life Ins. Cos. Member of the A. M. A., S. C. M. A., of the Medical Society of South Carolina; of the Tri-State (Virginia and the Carolinas); of the American Association of Obstetricians and Gynecologists; of the American Association of Southern Railway Surgeons, of the Medical Club; Charleston, S. C. He was also an honorary member of the Chatham County Medical Society of Georgia and of the Dorchester County Medical Society of South Carolina. He held at various times the office of President in the following organizations: South Carolina Medical Association, Medical Society of South Carolina, Southern Surgical and Gynecological Association, and was an ex-vice-president of the Tri-State Medical Association. He was also a prominent Mason.

Not until Oct., 1903, did Dr. Simons marry. At that time he married Miss Florence Alexander, head nurse of the Riverside Infirmary. Mrs. Simons proved of inestimable help to him and the advent of a son a year later still further added to his joy.

In order to appreciate properly his character, one must have known him intimately, and even then it is hard to express properly the great depth of character, the indomitable will, the broad charity he possessed. He was an omnivorous reader and student. All branches of medicine were of interest to him. He spent the greater part of his spare time with his books and magazines, and was abreast of any new movement. Always conservative, he did not rush after new fads, but was not far behind the leaders in any change of real worth. Even up to his last brief illness, he was doing daily an amount of work which



DR. MANNING SIMONS.



would have staggered many a younger man. In addition to a large general practice, he was also a surgeon of note. After his day's work was over, he would retire to his library and then frequently study until one or two o'clock in the morning.

In his lectures the remarkable tenacity of his memory was demonstrated time after time. Often the writer heard him quote authority after authority, giving volume and page of each reference. This, combined with his habit of study rendered him a perfect mine of information.

Dr. Simons was a man of lovable character. No one will ever know the extent of his charitable works. He was continuously driving and always with a large clientèle of charitable patients. To students and younger men of the profession he was kind and helpful. In spite of his wide knowledge and experience, he was humble in his opinion of himself and always seeking to learn. He was erect morally as he was physically. In his death he was the soldier and even his last words show the soldier quality of the man; "I'm going, but I'm going with my colors flying."

He was passionately fond of music and was himself a musician of no mean attainments.

To few men is it given to attain the age of sixty-four and still be showing no waning of intellectual vigor. Dr. Simons was one of these few. When an attack of angina pectoris cut short his career, he was still as alert and clear-visioned mentally as he ever had been. His loss to the profession of his State as well as of his City was keenly felt.

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## TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

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*Meeting of December 10, 1912.*

*The President, GEO. G. WARD, JR., M. D., in the Chair.*

DR. HERMANN GRAD reported a case of

### PULMONARY EMBOLISM.

Cases of pulmonary embolism, because of their infrequency, are always of interest. They occur when least expected and have tragic endings. A case of this kind fell to my experience. The history of the case is as follows:

Mrs. R., age fifty-two years. Was first seen in consultation on

September 29, 1912. The attending physician said that two days previously she was taken suddenly ill with acute abdominal pains, located around the umbilicus. A hypodermic of morphia was administered which gave prompt relief. Forty-eight hours later the physician was again hurriedly summoned and found patient with a temperature of  $103^{\circ}$ , and pulse 120. There was great pain in the right lower quadrant of the abdomen. When I saw the patient, a mass could be felt in the lower part of the abdomen, which was circumscribed and very sensitive to touch, and on a vaginal examination the lower end of this mass was indistinctly palpable.

She was admitted to the hospital, and on account of the low position of the mass in the pelvis a median abdominal incision was decided upon. On entering the abdominal cavity a mass of adhesions was encountered, and on separating the same, I came upon a gangrenous appendix lying down in the true pelvis. The appendix was tied off and a drain inserted. The patient reacted promptly from the operation, the temperature became lower, and finally normal within a week. The drain was removed and a very satisfactory recovery of the patient anticipated.

On the twenty-eighth day after operation, the temperature having been normal for nearly two weeks, she was allowed to leave her bed. She sat up for about two hours, felt no inconvenience whatsoever. She had a good night's sleep and received her breakfast in bed. Two hours after breakfast, while patient was still in bed, she was seized with pain in the cardiac region, and expired before anything could be done for her, or anything discovered about her condition. The nurse who was in attendance reports that from the time the patient was first seized with pain until she was pronounced dead, was only twelve minutes. We were able to obtain an autopsy in this case, and the following is reported by Dr. Strong, Pathologist of the Woman's Hospital.

*October, 30, 1912.*—The body of a woman, obese, rigor mortis absent. Abdominal incision 10 centimeters long, median line. There are firm adhesions between the abdominal parietes and omentum. There is a slight amount of clear serous fluid free in the abdominal cavity; peritoneum smooth, vessels injected.

*Thorax.*—Normal amount of clear pericardial fluid.

*Heart.*—Right side relaxed, empty; left firmly contracted. On cutting through pulmonary arteries *in situ*, firm, dark red, granular clots are found which are not adherent and which can be removed in long shreds extending into smaller divisions of both pulmonary arteries.

*Lungs.*—Collapsed; alveoli pinkish, dry, contain little air and no fluid; no areas of consolidation.

*Abdominal Organs.*—Kidney, spleen and liver show venous hyperemia; no other abnormalities.

Genital organs atrophic, no clots in pelvic veins. On cutting down on to right saphenous vein dark bluish-red varicosities appear which on section are found to be blood clots firmly adherent to vessel wall.

*Anatomical Diagnosis.*—Bilateral pulmonary embolism, secondary to right saphenous thrombosis.

The case represents several interesting features: First, the woman was fifty-two years of age and with absolutely no previous history of appendicular disturbances, is seized with sudden pain, and forty-eight hours later operation reveals a gangrenous and perforated appendix. She made a prompt and uneventful recovery and died as result of saphenous vein thrombosis which is carried by the current into the pulmonary artery completely plugging the vessel. It was of interest to me to see these clots which could be lifted out of the pulmonary artery with the greatest ease. The clots were about 2 or 3 inches in length, and of firm consistency, lying loose in the pulmonary artery.

It is an interesting question how these clots separate from their original foci, and how easily they are swept away by the blood current.

May it not be possible that septic conditions of the blood incident to the attack of appendicitis caused the clots to become detached from the vessel wall, where they originally lodged?

#### DISCUSSION.

DR. ASA BARNES DAVIS reported the case of a patient who entered the Lying-in Hospital after having been in the hands of a midwife; she had had a placenta previa. The doctor who was called in recognized the situation and the patient was sent to the Lying-in Hospital and delivered. She seemed to be in a septic condition. Blood cultures were taken, were repeated many times, and always with the report that they were sterile. There was no tenderness over the uterus but there was some thickening over the broad ligament. There was believed to be present a thrombophlebitis. The temperature which ranged from  $105^{\circ}$  to  $107^{\circ}$  F. suddenly dropped but only to go up again. In spite of the fact he could not get cultures of streptococci, antistreptococcus serum was asked for from the Board of Health. This was supplied but it had no effect whatever upon the course of the disease. Gradually the uterus involuted and the obstetrical condition assumed a normal one. The tenderness and the thickening disappeared, as well as the lochia. With the disappearance of these symptoms, there developed symptoms pointing to some pulmonary condition in the left lung, a very marked irritating cough which was constant, expectoration of muco-pus stained with blood. He expected from the symptoms to find pneumonia present. The expectoration increased, the patient became more ill, and showed a remarkable tenacity for life. Finally all the signs and symptoms disappeared from the left lung. After several weeks there occurred a consolidation of the right lung and it was believed that there was present an abscess of that side. On November 10 a needle was introduced into the abscess cavity and streptococci were found. On the following day a resection of a rib was done, the pus evacuated and



drainage instituted. Dr. Davis believed that this patient had a thrombophlebitic condition about the uterus and in all probability the thrombus became septic; then the emboli from this thrombus lodged in the right lung, broke down and set up this abscess which drained both ways.

DR. EDWIN B. CRAGIN believed that it was easier to understand why pulmonary embolism should occur in septic cases than in cases with normal temperature after operation or delivery. He wished some one would throw some light upon the etiology and means of prevention. He had met his Waterloo in a number of these cases. Recently, in a private obstetrical case, during an apparently normal puerperium, on the ninth day there occurred a rapidly fatal pulmonary embolism. In two other cases it occurred in the third week of an apparently normal convalescence after a suspension operation for prolapse. In another case it occurred after a Cesarean section. Last year during an operation upon a patient referred to him by our colleague, Dr. Savidge, for a very large fibroid, with the veins of the broad ligaments enormously distended, the remark was made that if she recovered without an embolus, she would be fortunate. She was unfortunate enough to have two pulmonary emboli occur, one on the fourteenth and another on the twenty-sixth day following the operation, but made a good recovery. These tragic accidents may occur after any operation upon the pelvic organs, or the appendix, no matter how simple, but in his experience they have seemed to occur most frequently in cases where the veins of the broad ligaments were more or less varicosed.

DR. ROBERT L. DICKINSON said the "Travel Club" was amused by the many mechanical devices operating at the Tübingen clinic. One of these was a derrick at the foot of the bed, from which arms and supports extended, operated by a motor, to swing the lower limbs of patients part of every day after operation, as a preventative of thrombosis.

DR. ROBERT T. FRANK spoke of the uncertainty which attaches to this difficult problem. Two men of such large clinical experience as Drs. Cragin and Brettauer differed radically as to the class of cases most subject to thrombosis; the former having seen it most frequently in subjects with dilated veins, the latter in those with many small veins. In every case the question arose whether thrombosis could occur under entirely aseptic conditions. If so, were mechanical agencies or blood and vessel changes the cause? It seemed to him not unlikely that small areas of mild septic phlebitis, unnoticed during life or overlooked at autopsy were often the primary foci of far distant thrombi. This subject was of utmost importance. It had been most extensively studied in Germany. The knowledge gained had borne practical fruit in the abandonment of the extensive exposure of the levator ani during perineoplasty. During this type of operation innumerable small veins were necessarily bruised or opened and postoperative thrombosis and embolism correspondingly frequent.

DR. BROOKS WELLS felt that the proportion of cases now showing thrombosis or embolism after surgical operations was steadily growing less. His own experience led him to feel that in pelvic operations, for instance, the avoidance of injury to walls of veins by gentleness in handling and by the absolute avoidance of clamping forceps on any tissue that was to remain, the avoidance of long slowing of the blood stream by early mobility and the lessened sepsis due to better technic, were the most important factors in reducing the chance of thrombosis and embolism.

DR. HERMAN GRAD said that the pulmonary artery was completely plugged with thrombi, which were 2 inches long and even longer. The thrombi came from the saphenous vein. In this case the thrombi could not be the result of handling of tissues during the operation; they were entirely out of the field of operation. The septic process perhaps set free the thrombi.

#### INTRAUTERINE TREATMENT OF PUERPERAL SEPTICEMIA.\*

DR. WILBUR WARD, of The Sloane Hospital for Women, read the paper.

#### DISCUSSION.

DR. JOHN O. POLAK said he had been exceedingly interested in the papers just read and was glad to hear what Dr. Davis and Dr. Ward had to say regarding the work they had been doing. He wished to congratulate them on the excellent work they have been doing in Manhattan where they evidently did not get as much sepsis as in Brooklyn. He was surprised that the active treatment employed at the Sloane Maternity should give such a low mortality. During the last five years he had had the opportunity of seeing many septic cases each year. At the Jewish Hospital he had seen as many as 75 or 100 cases a year and also a very large number at the Long Island College Hospital. Two years ago he had reduced his mortality to 4 per cent. During the past two years it had been reduced still lower. This was done by not doing what he had formerly advocated, *i.e.*, every septic case was studied as to bacterial and clinical diagnosis, when these patients were brought to the hospital, they were immediately cleansed; the vulva, vagina and cervix carefully sterilized if the cervix was patent. The uterus was digitally explored, if anything was found it was removed digitally, and then the uterus was packed with gauze soaked in iodine left in place for twenty minutes, and then withdrawn. Blood examinations were made daily, blood counts were made and checked. In these cases the Fowler position was used and we had a 4 per cent. mortality. For over one year he had not explored the uterus at all; digital exploration and curetage had been abandoned; an intrauterine culture was taken in each case, but the content was not disturbed. That was the only thing that was done. He believed in leaving these patients as much

\* For original article see page 464

as possible alone, except to elevate the head of the bed from 24 to 30 inches, to secure postural drainage. An initial dose of mixed polyvalent vaccines was given immediately the diagnosis was made and if this increased the leukocytosis, the vaccines were repeated every fourth day. By this method of procedure his mortality had been reduced to 2 per cent. This had been brought out by Drs. Watkins and Curtis of Chicago, and he had been able to convince himself that he should not go into the uterus in these cases of puerperal sepsis, or septicemia. The inside of the uterus was just like a wound and all that was required was proper drainage. The proper use of posture secured this, it produced wonderful results in assisting drainage. Even when there were streptococci in the blood the employment of the postural treatment resulted in some improvement. Dr. Polak was very much opposed to any intrauterine treatment in these cases.

DR. GEORGE G. WARD asked Dr. Polak how many cases he had had.

DR. POLAK replied that he had had fifty-one.

DR. EDWIN B. CRAGIN said that the methods employed at the two hospitals, the Lying-in and the Sloane Hospital for Women, did not differ as much as at first one might think. The principles followed as each were similar, *i.e.*, securing drainage and an empty uterus with in little traumatism as possible. There were some cases in which the upright posture interfered with drainage rather than favored it. It was uncommon on the ninth, or tenth day, when the patient was first allowed up, to meet with a rise of temperature due to a retention of lochia caused by an anterior, or posterior flexion of the uterus. In these cases the upright posture had interfered with drainage. In some of these cases the temperature would rapidly subside if you left them alone, in others the drainage was more rapidly established by a hot saline vaginal douche and in still others the best treatment was a gentle saline intrauterine douche. They believed at the Sloane Hospital that if there was any doubt about the uterus being empty of blood clots and portions of placenta and the temperature did not come down after one intrauterine douche, the wisest plan was with the sterile gloved finger to very carefully explore the interior of the uterus, remove any loose material found with the least trauma and then having made certain that the uterus was empty, leave it alone. The reason that they did not fear to use a vaginal douche at the Sloane Hospital as they would in private practice, or in the tenements, was that at the Sloane Hospital the vulva is shaved before delivery, it is thoroughly cleansed and after that the vulva is kept covered with a sterile dressing. Moreover, the greatest care is taken by the nurse, under constant supervision, to have the douche cans, tubing, tips and her hands, sterile. They relied upon fresh air, posture and drainage without vaginal or intrauterine treatment as much as possible, but cases with much organic material within the uterus they believed were best treated by emptying the uterus with the least trauma possible.

DR. J. CLIFTON EDGAR said that in these cases he usually drew a line of distinction between cases of abortion and others at or near term for there were certain differences in the treatment of patients

with incomplete abortions and incomplete deliveries. Any one present could recognize the difference between uteri at the twelfth or fortieth week. Even Dr. Polak would not leave the decidua at the twelfth week. We should draw a line between the early and late abortions in these complicated cases. Dr. Edgar did not hesitate to explore the uterus after the twelfth week and use, if necessary, a sponge stick or curet. Most would agree that the rubber covered finger was an insufficient means for removing the decidua from a uterus which was the site of an endometritis. In such cases seldom was anything brought away other than blood clots.

Dr. Edgar said he was in accord with the conservative attitude taken in regard to patients with puerperal sepsis at term; there was a present tendency to conservatism. As had just been stated, if the patient was seen by a competent physician and carefully examined, the patient should be given the benefit of any doubt, and the uterus should not be explored. If in doubt, however, and without any good history, it seemed to him that exploration with the rubber glove could do no harm after the vulva, vagina and neighboring parts had been carefully cleansed and so no soil for infection left. The employment of simple and clean means was, in his opinion, the better.

The use of vaccines and sera had been referred to, but he was not at all enthusiastic regarding their use and he had given them a thorough trial. It should be noted though that after four or five years experience which Dr. Park of the New York Board of Health had had with the 14 or 15 strain, there had been reported some remarkable results. Dr. Edgar himself had reported a series of cases at the Clinical Society and he believed that the results obtained were more than coincident and Dr. Park had in his possession the records of many more cases. In one instance he recalled there was presented the clinical picture of an infection, a bacterial infection, or a sapremia; 60 cubic centimeters of the polyvalent serum was administered and improvement followed within twenty-four hours. It showed that in some cases the use of the serum would result in benefit. This amount of the serum was repeated in twenty-four hours.

DR. AUSTIN FLINT, Jr., said that there was to-day a marked tendency on the part of obstetricians not to attempt anything radical in the treatment of puerperal sepsis. At the same time, in cases which had been under treatment by others, one was very uncertain about the wisdom of leaving the uterus alone or refraining from an intrauterine exploration. The whole question of the treatment of postpartum sepsis was a very important subject. Often what was proper and suitable in one case was decidedly harmful in others. He saw many mild cases of infection, where the uterus was not infected at all, and the disturbance was caused entirely by the infection of wounds caused by the passage of the child through the cervix or through the vulva. We should always remember that there was a possibility of infection in the three following situations:

- (1) The placental site.

- (2) Cervical lacerations.
- (3) Vaginal and perineal lacerations.

Each of these would require different methods of cleansing and drainage.

Some women developed a moderate temperature of  $101^{\circ}$  or  $102^{\circ}$  within forty-eight hours of confinement—or even as late as the third day without any septic infection of the uterus whatsoever. These cases would do better without interference, excepting the giving of a vaginal douche. Intrauterine manipulation, such as douching or curetage, would always do harm. If the infected parts were kept clean no general infection would follow, as a rule. In cases where temperature existed and no infection of perineal laceration or of the cervix could be demonstrated, it was fair to infer that it was due to an infection of the uterus itself. At Bellevue Hospital and at the Manhattan Maternity Hospital a single intrauterine douche was often given and usually was followed by a fall in the temperature, to normal. As a matter of fact the intrauterine douche was used less and less often. Dr. Flint recalled a case of placenta previa centralis in which the child was delivered through the substance of the placenta. The lochia was discharged over the placenta site and the patient developed a temperature lasting three or four days and due to the absorption of lochia. A single intrauterine douche was given, to which alcohol was added, with the result that the temperature at once became normal from the fact that no more absorption of septic matter occurred. It seemed to him that the use of these means was good practice and that it would not have been wise to have trusted to posture and drainage alone.

With regard to the use of the antistreptococcus serum, he had been using it for sometime at Bellevue Hospital and for a short time, about two years ago, almost as a routine practice. In the majority of cases he had been disappointed in his results but in some cases there had been no doubt but that the results were good and were due to the use of the serum and not to other measures which were employed at the same time. It therefore seemed to him that the use of serum had its distinct place in the treatment of some of the more desperate cases.

In all cases drainage was most important and one was often surprised at the results which followed noninterference, provided good drainage could be secured.

DR. JOSEPH BRETTAUER said that it had been a long time since he had had such pleasure as in listening to the papers read by Dr. Davis and Dr. Ward. He had followed the principles advocated by both readers for more than twenty-five years. Of course all understood as he did, that there was a big difference in the results obtained in dealing with the thousands of cases under their own observation in hospitals and institutions and the hundreds of cases delivered by midwives, which came to the hospital two or three weeks after delivery. The statistics in these cases cannot be compared, for they are different from every point of view.

With regard to the results obtained by posture in these cases,



Dr. Brettauer said that his results without ever using posture were practically the same as those obtained by Dr. Polak with posture in the same class of cases. Posture alone could not be efficient and when results in pelvic conditions are attributed to posture, he believed it to be an illusion.

DR. GEORGE W. KOSMAK said that there were two points of interest and importance in connection with the discussion of puerperal sepsis, which must be kept in mind.

First, as regards to the wound in the uterus. It was not, as has been frequently stated, the same as a wound in any other part of the body. From both the anatomical and the histological standpoints it presented very marked variations from ordinary wounds, and no comparison should be drawn between them as they were entirely different. The nature of this wound made it reasonable to suppose that the area of absorption could be restricted by the administration of oxytocic substances. At the Lying-in Hospital it had been customary to administer ergot in some form or other to cases of uterine sepsis in order to limit the infection by producing a contraction of the musculature of the organ, and in this way limiting to a certain extent the venous and lymphatic channels of absorption. In small repeated doses no harmful effects had been observed from the use of ergot, such as the production of a contraction of the cervix, without causing contraction of the uterus.

Second, with regard to the douches, it was possible unless great care was exercised, to force the douche water through the ostia of the Fallopian tubes into their canal and the general abdominal cavity. Although this might seem improbable, the speaker said that it had been demonstrated conclusively to his satisfaction in a number of cases. In one case after a curetage with irrigation in the usual manner previous to an operation for ventral suspension, a considerable quantity of douche water was found in the peritoneal cavity when the abdomen was opened. Moreover, in certain puerperal cases, after the employment of the intrauterine douche, the patient would have a severe chill, followed by a rise of temperature, with pain in one iliac fossa or the other over the region of the tubes, which evidently pointed to the presence of an acute inflammatory reaction in this structure. On bimanual examination a tender and usually an enlarged tube could be palpated. In administering a hot intrauterine douche, the cervix would be apt to tighten around the nozzle and the return flow impeded with the result stated. For this as well as the other reasons referred to by previous speakers, the intrauterine douche should be restricted in its application as much as possible, and only administered with the most careful precautions.

DR. GEORGE L. BRODHEAD said that in private work, when the temperature was elevated on the third day for example, and the breasts and bowels could be eliminated as factors, he was accustomed to give a warm normal salt uterine douche. If the temperature rose again on the following day, he resorted to the use, as Dr. Flint had suggested, of a 50 per cent. alcohol\_douche. In giving



these douches, he believed that the douche solution should be only warm, and that the douche container should be elevated not more than a foot above the level of the buttocks, a very hot douche, or one given under pressure often resulted in a severe chill followed by a high temperature. If the alcohol douche did not reduce the fever, the uterus should be explored. In a recent case at the Gouverneur Hospital, a patient had, after a normal labor, a temperature of  $102^{\circ}$  within eighteen hours after the birth of the child. Blood tests, smears and cultures were negative, and when the alcohol douche proved inefficient, the uterus was explored and about  $1\frac{1}{2}$  ounce of retained placenta was removed, when the temperature came to normal and remained there. Such a patient certainly was greatly benefited by the uterine exploration. Patients who were admitted to the hospital with apparently septic temperature, had a digital exploration at once, and if the uterus was found empty, there was no further uterine treatment. Dr. Brodhead said he agreed with Dr. Davis, that antepartum and postpartum douches were usually unnecessary, and were not to be used except for strict indications. His results with sera had been practically nil.

DR. ASA BARNES DAVIS, closing the discussion, said that there was a difference in the management of these cases; there was a relative difference in the case of the uterus after the twelfth week and they did not hold that there was such a thing as a complete abortion. The placenta came away in an incomplete way. Their statement obtained from the woman and what they had found in these cases did not bear it out. They made it a rule to curet every such case that came into the house, curetting patients with or without temperature. It was the mechanical removal of the contents of the uterus which counted. There was a mechanical drainage which was desired. The lack of drainage because of a closed uterus, cases in which the cervix was closed, leaving septic material within that organ, was the cause of their troubles. Septic material was left in and in this the lochia would collect. Posture alone would not empty the uterus. Sometimes the vaginal douche would promote drainage or the sponge forceps might be used to advantage. If, however, an intrauterine douche be given one would get good results. There was another condition, one in which the uterus was large and toppled over, forming a bridge, as it were, in which the lochia collected. In some of these cases posture might afford relief.

There were certain forms of pelves where the lochia would collect and not drain out and where drainage could be established by posture and the condition relieved. In some cases lifting the head of the bed and allowing the patient to sit up two or three times a day would be effective and the results gratifying.

## TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

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*Meeting of November 7, 1912.*

*The President, GEORGE M. BOYD, M. D., in the Chair.*

DR. WILLIAM R. NICHOLSON presented the

### REPORT OF A CASE OF VAGINAL CESAREAN SECTION WITH LOCAL ANESTHESIA DURING ADVANCED PHTHISIS.

This was a case of acute tuberculosis in late pregnancy in which because of great and increasing dyspnea and cardiac failure it seemed proper to terminate gestation. On account of the great weakness of the patient it seemed impossible to subject her to any strain of labor and it was therefore decided to deliver by vaginal hysterotomy. As the lung and cardiac condition rendering any general anesthetic hazardous, the attempt was made to perform the operation under local anesthesia. Stovain and adrenalin was the anesthetic decided upon and it was found that the cervix could be dilated with ease and without pain to 7 centimeters, the bladder dissected off the uterus to the peritoneal reflection and the first incision of several centimeters made in the anterior wall without pain. At this point the patient made complaint and chloroform was resorted to. Inhalations of chloroform were given for eight minutes while the section of the uterus was completed, version done and extraction and repair performed. It is the opinion of the reporter that the operation could have been completed by repeated injections of stovain and that it would have been better perhaps to have done so as the patient collapsed under chloroform and proved the wisdom of the attempt to deliver by local anesthesia alone.

The fact that this patient was a multipara made the operation easy in this case but it is to be remembered that the operation is not a difficult one in the majority of cases to a man familiar with vaginal work. It is less dangerous than the so-called rapid methods of emptying the uterus by forcible dilatation of the cervix, from the standpoint of trauma and in competent hands is less likely to be associated with sepsis than the bag introduction.

### DISCUSSION.

DR. RICHARD C. NORRIS.—I am interested to hear Dr. Nicholson's report of the case, and my feeling after listening to him is, that he has made this operation of vaginal Cesarean section a little too easy,

when he states that its safe performance is so little complicated that the average general practitioner should know how to do it. While I have not done the operation a great many times, my knowledge of the history of vaginal Cesarean section as well as my limited experience make me feel that it is a hospital operation. It has come to stay as a distinct addition to our obstetric equipment, but as I look back over my experience, the cases to which this operation will be especially applicable and more frequently used are the cases of early pregnancy requiring emptying of the uterus. In primiparæ under conditions requiring immediate evacuation of the uterus near the end of pregnancy the operation has a field. In multiparous women where the tissues are more yielding and the cervix more accessible, its field will not be quite so large.

As to the question of version or forceps after vaginal Cesarean near term I am not in accord with Dr. Nicholson. It is a matter, however, of one's own convictions. Generally speaking, forceps delivery of a baby gives better chances for the baby than version. The generally appreciated contraindication to forceps on the floating head is true. In multiparous women when the cervix is fully dilated and we rupture the sac, it is a common experience that after the next hard pain or two the baby is born. When the soft tissues are freely incised as they are in this operation, the primiparous woman will have a similarly wide open birth canal. The cervix has been freely opened and when we come to the forceps extraction of the baby's head, if the pelvis is normal, and the child is of average size, we have, I believe, a better chance for the child with forceps than by version. If the operator has not made sufficient opening in the anterior wall of the uterus and one does version to save the baby, he must act quickly and he will sometimes produce excessive laceration that may be wholly beyond his control. If he is using forceps he has time to make his incision larger if it be necessary. The statement has been made in Peterson's paper that the maternal mortality was less after extraction with the forceps. Taking the early cases the infant mortality was less after version. Application of forceps here is detrimental, but within a few weeks of term or at term, I believe that the baby will have a better chance if delivered with forceps. To sum up the situation, as I see it, vaginal Cesarean section in the future will find its greatest field in the earlier months of pregnancy rather than at or near term, when it will be indicated more frequently in primiparæ than in multiparæ.

DR. ALONZO E. TAYLOR read a paper on

#### THE RELATION OF ECLAMPSIA TO THE NITROGEN METABOLISM.\*

#### DISCUSSION.

DR. RICHARD C. NORRIS.—I have been exceedingly interested in what Dr. Taylor has said to us and it has confirmed what has been in my own mind for some time. In pregnancy toxemia more and

\* Article to appear later.

more, it has come to be thought that there is a toxin, having its origin in the placenta, which suddenly overwhelms the patient just as any other poison when suddenly taken into the circulation. Again there is much evidence that a pregnant woman is constantly taking into her economy certain products of conception which she normally is able to take care of. Because of the wonderful chemistry of her body which includes the functions of the ductless glands she is able to keep pace with this absorption. When this unknown chemistry becomes sluggish she develops a toxin which begins its action on the central nervous system and is often first manifest in the circulation. Many of the functional disturbances of the kidney, no doubt, have a circulatory basis due to the action of this unknown poison on the central nervous system, which thus gives us one of our clinical symptoms. Increase of blood pressure; deaths without convulsions, as from cerebral edema with coma, from pulmonary edema, from cardiac failure; and finally an overwhelmed circulation with lowered tension, all point to a toxin affecting the central nervous system. Whether the placental origin will be found the more important origin of toxemia remains to be proved. It is up to the physiological chemist to study the toxins and ferments. We have, perhaps, been studying the blood and its anatomical changes too much. Albuminuria and casts are also danger signals, but other urinary studies, such as the nitrogen partition, I have found of no real clinical help. Under our treatment headaches will disappear, arterial tension will drop and signs of oncoming toxemia will disappear, but until the toxin has been isolated by the chemist we cannot treat our patients scientifically. We do know that there is increased arterial tension. We have means of reducing that and starvation is one of them, since we know what effect starvation has upon arterial tension. Our treatment is to eliminate the unknown poison and reduce arterial tension. We are still in the dark and we have to struggle on with our empiric treatment, but I think we are coming to the belief that with the recognition of the toxin we shall have a more efficient treatment. The value of sugar is that it can be taken care of by the body with the least metabolic energy. Since a conversation with Dr. Taylor last year all the septic cases I see are given sugar freely for its high nutrition value so essential for sepsis. Its special value in toxemia is not so apparent. Starvation is not, according to my idea, solely to bring about a change in the nitrogen metabolism of toxic cases but to reach some of the other symptoms produced by the toxins present, notably the rise in arterial tension. It seems rational, however, to withhold food from a toxic patient whose metabolism is struggling to save her, and thus spare her for a time from the metabolic energy required to take care of the food poisons.

DR. COLLIN FOULKROD.—The subject is so bewildering, because of the many new theories advanced, that from day to day we do not know where we stand. We give credit to those who have studied nitrogen metabolism and have attempted to use such studies in practice.

Those of us who think much must acknowledge that during pregnancy there is in the body evidence of the action of something other than just the normal organs. If this were not so, then every woman who became pregnant would develop syncytioma malignum.

In the first two or three months of pregnancy this protection preserves the normal balance of the organism. If it should be in any measure absent, the patient becomes toxic.

Later in the pregnancy, there is developed by the growth of syncytial tissue a protecting body which may limit the time of pregnancy much as typhoid or pneumonia is limited. Should this be absent we again have disturbed metabolism perhaps of any of the organs.

We have learned from experience and investigation that certain changes occur in the nitrogen metabolism, which we have never advanced as a *cause* of toxemia, but merely an indicator or guide as to the grade of toxemia, when used in conjunction with other studies.

We would be unjust to our patient if, because we cannot tell her the basic cause of her disturbance, we neglected investigations which would at the earliest possible moment detect disease and suggest a method of relief.

DR. TAYLOR, in closing.—There is no warrant for the statement that we possess in urinary analysis any pathognomonic sign for the oncoming of eclampsia. There is no known state or condition in the urine either before or during an attack of eclampsia, by which it may be diagnosticated. The more or less current contrary opinion is based upon misconception of the proper controls of urinalysis.

DR. COLLIN FOULKROD read a paper on

CESAREAN SECTION FOR CENTRAL PLACENTA PREVIA, WITH REPORT OF A CASE.\*

DISCUSSION.

DR. DANIEL LONGAKER.—Personally I have not seen a case of placenta previa which I believed justified delivery by abdominal Cesarean section. Some years ago I collected and tabulated my cases. I had then twenty-five with a single maternal mortality. The patient was in a bad condition when brought in. Version was performed. She continued to bleed after delivery and contrary to my expectation she died. That is the only case of placenta previa that I have ever lost in my entire experience and that must now embrace something like forty cases. Of course the treatment must be individualized. The very last case which I saw had recently come into the hospital. The woman had bled quite a little, had had a second hemorrhage. She had born a number of children and the parts were quite dilatable and I chose to treat that case by simple rupture of the membranes. I remember saying to the resident that I believed the patient would deliver herself within two hours. The head was very promptly on the perineum and the woman delivered

\*For original article, see page 459.

herself of a living child and this without my doing anything more than rupturing the membranes. The case was not one of central placenta previa, but of marginal placenta previa. Had this plan not been followed she would have gone on indefinitely and it is supposable that by ordinary methods, still too often followed, she might have lost her life. I think there are many reasons why the tampon is objectionable and I have never in a single case used a tampon in the treatment of placenta previa. The reason it is objectionable is that it adds to the mortality and the morbidity through the deleterious action of antiseptics and through its harmful mechanical action on the defensive forces of the organism. My cases of placenta previa have not been of the character of the cases spoken of by Dr. Foulkrod. In the majority of cases it is an easy matter to introduce one or two fingers through the cervix and do a version. The mistake is in not following the plan mentioned by Dr. Davis, in not leaving the case to the natural expulsive forces, not only doing version but an immediate extraction and this is perilous. The single argument in favor of Cesarean section is the lessening of the fetal mortality. I must admit that ordinarily this is going to be high, perhaps over 60 per cent. Therein lies, I think, in the majority of cases, the single argument in favor of Cesarean section. I am perfectly willing to admit that it is a very powerful argument in favor of this method of treatment.

DR. RICHARD C. NORRIS.—A problem of this kind cannot be determined by statistics. Of that I feel quite certain. Cases must be analyzed. The conditions of the mother and fetus at the time of the selected treatment must be critically studied before statistics can help us. I am prepared to believe that there are cases of complete placenta previa in which the interests of both mother and child are best served by abdominal section in the hands of a skilful man. These conditions, however, are rarely met with. We must find the limitations of rather than widen the indications for Cesarean section in placenta previa. In the most serious type of placenta previa free and dangerous hemorrhage is usually the first diagnostic symptom. In the presence of such a case with, as is usual, a premature baby, the question of Cesarean section does not enter as a means of saving the baby's life. The question is what is to be done for the mother? I have learned from my experience with this type of case to count the child's life as worth very little and as a small element in the formula. There are no doubt some cases at term with grave hemorrhage, a viable child, a rigid uneffaced cervix, and no suspicion of infection, in which with a skilful surgeon, hospital environment, etc., Cesarean section is indicated. In such cases it is unquestionable that Cesarean section is desirable. In most cases of complete placenta previa, the cervix is soft and dilatable, the patient exsanguine, the fetus opneic and usually premature, and infection is suspected; I cannot see why Cesarean section should be considered the most efficient means of treatment, under these unfavorable conditions. When more favorable conditions are present, it is possible to save the baby by the less severe method of treatment.



Regarding the tampon and danger of infection I may say the danger is largely one of septic material and technic. There is danger of hemorrhage in these cases after they have been delivered and a tampon is always indicated from fundus to vulva. Our aim should be to teach men that the tampon treatment, if selected by them as a temporary measure, must be done in the most aseptic, most cleanly manner possible. Whether vaginal Cesarean section will find a place in this field is uncertain. It is true of every operation in obstetrics that conservative men will keep within a certain limit and the more aggressive will reach out further. After a while we ascertain the correct status back of men and of measures. The real danger in tamponing is in the way and by whom it is done. The important point is surgical cleanliness from the beginning. That is the lesson, I think, that should be carried to the general practitioner, rather than try to teach him to treat his cases of placenta previa by Cesarean section.

DR. WILLIAM R. NICHOLSON.—It seems to me that, as Dr. Davis has said, the difficult cases should be sent to the hospital. We would not have our present statistics in appendicitis and other surgical conditions if we were required to carry on our treatment under the conditions governing the ordinary obstetric operation in the private house. I believe that in a few years the better class of women, especially primiparæ, will almost entirely enter hospitals for confinement. It seems to me that the trend in obstetrics at the present day is treatment on surgical lines. Under the conditions given in Dr. Foulkrod's paper, excepting the one single case in which he himself suggested the possibility of other treatment, it seems to me that the conditions were fairly met by the Cesarean section. A point suggested by Dr. Norris regarding the value of vaginal Cesarean section in this type of case interests me. It seems to me that if you can incise the cervix in the lower uterine segment, a man who is used to doing it, can get the child and the placenta, out with less loss of blood than by dilating a tight cervix and bringing down the foot. I had a case a couple of weeks ago of placenta previa with rigid cervix. These cases are rare. I felt that I could not with safety dilate that cervix and could not do a version with safety to the woman. The patient was in a hospital where I felt that the technic was good and it seemed to me better to treat the case surgically and get it through with. The point was simply the proposition of getting the baby out before the woman bled enough to hurt her. She had had several hemorrhages and had been treated outside with tampons. I incised the cervix and delivered the baby without the slightest difficulty. I, of course, tamponed the uterus afterward. I would not leave a case without tamponing either after placenta, previa, accidental hemorrhage or postpartum. I believe vaginal Cesarean has a field in selected cases of placenta previa. It is done with less shock, more quickly and with avoidance of the conditions in the abdomen found by Dr. Foulkrod.

DR. WILLIAM E. PARKE read a report of a case of

## CESAREAN SECTION FOR ECLAMPSIA.

C. B., *et.* twenty-nine, white, Polish, primipara, supposed to be eight and one-half months pregnant, was admitted to the hospital in a semicomatose condition, following convulsions at home, with much swollen and cyanotic face and swollen limbs. Fetal heart sounds were audible and the head floating. Vaginal examination showed a long multiparous vagina, cervix high up and uneffaced. The systolic blood pressure was 210. Owing to the unfavorable condition for forced dilatation of the birth canal, an expectant plan of treatment was adopted. Sixteen ounces of blood were withdrawn from the arm. The stomach washed out and croton oil and four ounces of saturated solution of magnesium sulphate passed into the stomach through the tube; hot packs applied and nitroglycerin and veratrum given by hypodermic. From the admission at 7 A. M. until 7 P. M., no results had been secured from the efforts at purgation and during this period she had had eight convulsions. A compound enema now started the bowels and three good motions followed. Six hours later her systolic blood pressure was reduced to 145 and twelve hours later it was 115. She had no more convulsions. Two days later her systolic pressure fluctuated between 122 and 170 at different periods of the day in spite of very active treatment with chloral hydrate, veratrum viride, purging and sweating. On the third day it was 195-200. On the fourth day it was 200 at 1 A. M. and 238 at 8 P. M. On the fifth day the condition was unchanged and operation was decided upon, the indication for Cesarean section being primipara with floating head and undilated cervix, high up.

For three or four days after operation the kidney output was very scanty, she remained greatly swollen, and the blood pressure which fell to 145 immediately after operation rose to 192 by noon of the following day and then slowly subsided to about normal.

A week after operation she was well started on the way to recovery—which was uneventful thereafter.

The child lived for 10 weeks. It did not weigh any more when it died, than when it was born. The operation was undertaken primarily in the interest of the mother.

## DISCUSSION.

DR. FOULKROD, closing.—While under some circumstances it may be very well not to teach the general practitioner to think about Cesarean section, we need to teach him here, that he may keep his hands off, if he can get the patient to a hospital. If he has to treat a patient away from the hospital, that is a different matter. I believe that gauze packing is definitely responsible for many infections under such circumstances.

I simply record these cases in an effort to bring about some plan whereby we can get definite results and statistics to prove whether or not the treatment is a good method. The results in placenta previa by other methods have not been very good. In the other forms of placenta previa that have come under my care, I have not lost a case by the vaginal methods of treatment.

*Meeting of December 5, 1912.*

*The President, GEORGE M. BOYD, M. D., in the Chair.*

SYMPOSIUM ON CESAREAN SECTION.

DR. E. P. DAVIS read a paper on

THE CLASSIC CESAREAN SECTION.\*

DR. BARTON COOKE HIRST read a paper on

THE ADVANTAGES OF SUPRASYPHYSAL EXTRAPERITONEAL CESAREAN SECTION IN BOTH CLEAN AND PRESUMABLY INFECTED CASES.†

DISCUSSION.

DR. ASA B. DAVIS, New York.—I know nothing from personal experience of the extraperitoneal method of operating. In our Cesarean sections we attempt to make the operation as simple as possible. I do not feel that we have reached the ultimate of surgical perfection in any method that we have, and I think we should keep an open mind for the newer methods of technic that are coming up, hoping that we may be able to get better results than we have at the present time. I am therefore very much interested in hearing Dr. Hirst's paper upon this subject. It has been our experience with the group of men we are working with that the operation has not been tried. We hold ourselves to the classic Cesarean section with modifications that are inevitable with a group of men. We use the high incision above or nearly above the umbilicus and near the midline. In going back about twenty years we find we were then doing the Säger operation. Eight of our first operations were done in the tenements and we found an objection to the Säger operation in delivering the uterus. The necessarily long incision in the abdomen and the manipulation which was inevitable in delivering the uterus we believed to be a disadvantage and an unnecessary interference. Following that there was the inevitable adhesion between the abdominal wall and the uterine wound. That result was impressed upon my mind by the first Cesarean section I did in which there were adhesions so firm that the abdomen was drawn backward with dragging of the uterus and complaint of pain so long as we kept trace of the patient. We began to make our incision smaller, and gave up the delivery of the uterus. Not finding it necessary to deliver the uterus we found it was not necessary to have so long an incision and gradually we made our incision higher up until we made it above the umbilicus. Some operators

\* For original article see page 451.

† For original article see page 456.

moderate it, but the principle of the high incision is to avoid the after adhesion of the uterus to the abdominal scar and not that we are looking for a small scar and a pretty abdominal wound. We make the wound large enough to allow an easy delivery, but after that we feel that with a small incision there is the less chance for intraabdominal manipulation and escape of intestine and omentum. We are not always careful to pack off the rest of the abdominal cavity but place one or two pads above the fundus to hold the omentum and intestines back. Not infrequently that is all we see of the abdominal contents. We make the incision and close the uterus *in situ*. The uterus takes up its place after it is returned to the lower part of the abdomen in the same position it occupies after a normal labor, and, as the speakers have said, the recovery differs very little from that of a normal labor. I have had recently, in an exhibition for the Clinical Congress, the case of a woman who was not in labor. I delivered her of a 10 1/2-pound child at her second Cesarean section. I could not tell which was the Cesarean scar of the previous delivery. There were no adhesions except of the omentum at the upper end of the wound. In an hour she was able to talk and on the twelfth day when she left the hospital she had forgotten any pain she had had. We purposely get the patients out of bed on the eighth day—the normal and clean cases—with the idea that the uterus will still further sink down toward the pelvis and draw away any minor adhesions that may occur and the uterus will drain better for that. On the twelfth day they leave the hospital with their children. We have had that repeated time and again. In several instances when upon the eighth day they will insist upon going home on the tenth day. In neglected cases we have not made the advance we should have. We have not done the Porro operation as you have here. Our results are not so good. Some of my own cases which have been infected I think might have been saved by the Porro or extraperitoneal operation. I know that the German operators are quite enthusiastic about the procedure. The Cesarean section, as has been said, has been made possible by advancing general surgery. The danger I think has also been pointed out that men imperfectly trained will take up the operation and bring it into disrepute. There is no danger whatever that a well-trained surgeon will do that. The operation is not a particularly difficult one for a man well trained in surgery. It is straight clean work with the outlines of the wound clear cut and under complete view.

There is another factor not sufficiently appreciated—the lay public and a certain contingent of the medical public still feel that the operation is a terrible one—the wonder operation, if you please, and the operation of last resort. Before Cesarean section reaches the place to which it is entitled we must get away from this “last resort” idea. It is not an operation of last resort. It should be an operation of election. The hospital patients are better educated along that line to-day than the lay public. At present a woman will accept Cesarean section as readily as any other operation. The

medical man should know that Cesarean section is done with a very low mortality and morbidity. I think we can safely say that the maternal mortality is not over 2 per cent. and oftentimes it is less than that. There are a considerable number of serious operations in which the mortality is *nil*. When men can report complete recovery of mother and child in every instance the operation should not be feared. In a hospital service we cannot always do that because we have patients who are on the border line, patients who die from other causes which are charged up to the Cesarean operation.

Another point that I think should be brought out is that after delivery by Cesarean section the woman's cervix and pelvic floor should be left in just as good condition as before labor began. I doubt if any of us can say that of all of our forceps and version cases. Personally I have done enough lacerations and injuries to the cervix and genital canal to make it easy for me to do a Cesarean section while there is any prospect that delivering by the vaginal tract will mutilate the patient unduly. The skill of the surgeon is not equal to repairing the mutilations so that the parts will be functionally the same. The repeated Cesarean section the woman goes through without much trouble. In the Lying-in Hospital in New York we almost never sterilize a patient. I personally sterilized one case and half sterilized another, promising complete sterilization in that case. The woman is pregnant again and is awaiting her sixth Cesarean section. She had a craniotomy with her first delivery which was her most difficult delivery of all. Dr. Hirst's paper I heard with great interest and should be very glad to see the operation done.

DR. RICHARD C. NORRIS.—I have had the pleasure in the last four days of seeing two extraperitoneal Cesarean sections and have done one by the classic method myself. As I look upon this subject I feel that one must view the extraperitoneal operation as an evolution of the subject of Cesarean section and we are not at the present time in position to draw definite conclusions and shall not be until more work is done in that line.

To properly study results the cases should be divided into clean and infected cases or "suspect" cases, as the English call them. I do not know of a group of extraperitoneal Cesarean sections done on clean cases with the mortality rate given exclusively for that class of cases. We use such a classification for the classic section. Dr. Hirst's and others' work will help us to evolve the relative dangers of the operations. We know that serious adhesions, even rupture of the uterus, may rarely follow the classic section. There have not been done a sufficient number of operations by the extraperitoneal method and sufficient time has not elapsed to determine what will occur from adhesions and fixation of that portion of the uterus which must be dilated in the next labor. We know that infection gives us peritonitis with serious prognosis for both types of operation. The extraperitoneal would more likely involve the lymphatics and veins, giving us thrombophlebitis which perhaps is not so dangerous to life. The question of which structures can best take care of them-

selves in various grades of infection is not wholly determined. In the classic Cesarean section we know what we can do in clean cases, and we know pretty well what and how great the danger is in infected cases.

From my reading and study of the extraperitoneal Cesarean section, up to the present time I believe it has not done what we hoped it would do. The mortality in infected cases is very little less than in the classic operation. Statistics do not prove anything at all. I could pick out a group of the classic or of the extraperitoneal type with their accompanying mortality, but without an analysis of the individual cases we cannot form a comparison.

As to the technic: one operator reports fifty cases of extraperitoneal section in which ten times the peritoneum required suture and giving a mortality of from 6 to 8 per cent. These may or may not have been infected cases. Again we can quote statistics of sixty consecutive Cesarean sections of the classic type, without infection, with no mortality. Statistics to my mind prove nothing. We must have groups of infected cases and compare the results of the two operations in similar groups. When in that field, however, we are again confronted with uncertainty. Who can say how seriously infected the woman may be? Even if we know the germ anatomically can we always measure its virulence or the patient's resistance in individual cases?

Regarding the technic of the extraperitoneal operation, the peritoneal fold between the bladder and uterus is sometimes so low anatomically that you have not the space to do the operation readily. Sellheim's technic, in which we open the peritoneal cavity, obviates that disadvantage; but in infected cases if you open the peritoneal cavity, you are perhaps on the level of the classic Cesarean section in the presence of infection and its dangers. Operators must show us how often we dare do this; its dangers and its results in cases known to be infective.

Dr. Davis spoke of eventration of the uterus. We know that eventration in clean elective cases carries no risk. We know, also, that in similar cases in which the uterus remains in the abdominal cavity there is no great risk. I believe that, in suspected cases, if we turn the uterus out and protect the peritoneal cavity we are on the safer side. We have opportunities outside the peritoneal cavity to treat the interior of a suspected uterus that we cannot accomplish with the same safety while it is in the abdominal cavity. Every advantage is on the side of the eventration of the uterus in the technic of the classic operation, unless it can be proven to us that there are distinct dangers in eventrating the uterus.

The danger of adhesion to the abdominal wall is not to be put in the balance with the woman's life. Every argument has appealed to me that turning the uterus out with proper protection is an advantage.

Leopold reports his last 100 consecutive classic operations with a mortality of 1 per cent. The extraperitoneal operation will have a difficult task to beat that record. Leopold did eleven extraperi-



toneal operations with no mortality to mother or child. Whether any were infected cases I do not know. In the 100 cases of the classic operation no doubt he had some "suspect" cases. If we have clinically a seriously infected case the results of the extraperitoneal section up to the present time leave us just where we were five years ago. By the extraperitoneal operation we have not yet solved the difficulty. We are in the presence of a danger with either type of operation. Men become more skilful with experience, but when we have a serious type of infection, extraperitoneal Cesarean section has not yet declared that it is safe. The classic Cesarean section has declared that it is unsafe and that has led men to the extraperitoneal treatment of the stump. In an infected case I would remove the uterus taking no chances, or resort to craniotomy and give the patient a chance to fight her infection with our usual treatment. Craniotomy yet has a field of usefulness but its selection must be decided upon in each individual case. In its last 300 cases the mortality of pubiotomy has been reduced from 4 to 1 and a fraction per cent. by improved skill of the operators, yet not many men are doing pubiotomies now because we have not found it took the place of the classic Cesarean section in the infected cases or in the higher grades of pelvic deformity. We are pretty much where we were five years ago and I trust that the evolution of the various operations will bring us to the point where we can say this or that operation is to be chosen at this time, for this particular case. Until we are able to determine exactly the character and virulence of the infection and the patient's resistance in an individual case upon which we are about to operate, until that comes to us by some method at present unknown to us, we are on doubtful ground in major obstetrics for infected cases whether the operation is the classic Cesarean, extraperitoneal section or pubiotomy. Until further proof is offered, I shall choose for the elective Cesarean section the classic section with eversion of the uterus; for suspected cases, craniotomy with limitations; for evidently gravely infected cases, hysterectomy with extraperitoneal treatment of the stump. In some suspected cases, when symptoms of infection are not manifest, I believe I would attempt the extraperitoneal operation, endeavoring not to open the peritoneal cavity. The safety of this operation can only be determined by a group of operators offering their results. Dr. Hirst's work in this operation is in line of progress and the future will decide for him and us its true merits.

DR. DANIEL LONGAKER.—There is one point I should like to hear mentioned by those who may participate in the discussion. It is the treatment as well as the pathogenesis of one of the disagreeable and troublesome features that occasionally complicate the convalescence, acute dilatation of the stomach. It has occurred to me in ten cases to see this complication three times, once terminating fatally. I agree entirely with the last speaker with regard to eversion. I have uniformly followed it and believe it not only innocuous but advantageous in every way.

One point raised by our guest was that of our doing missionary

work along the lines discussed. I think it would be well if sometime this Society held a meeting at which all of us would tell some of the gruesome experiences that occur in consultation practice. In illustration of this I might mention a case occurring two days ago in which I was hurriedly called to do a forceps operation. I arrived at the patient's house within half an hour to be told that the baby was already born, but dead. The attending physician, a graduate of one of our best colleges, of some ten years standing, told me that there had been an occipitoposterior presentation and an awful case, *with adherent placenta*. We all know what that usually means. There should be some missionary work done in order to correct the horrible brutal obstetrics that is still practised. A knowledge of the possibilities of the Cesarean operation is going to be a potent means of advancement.

DR. STRICKER COLES.—In those cases in which forceps have been applied I believe the classic Cesarean section is indicated. In a case which Dr. Davis operated upon yesterday the broad ligament was torn, the uterus ruptured and the child was dead, with fracture of the cranium. In a case operated upon two weeks ago there was a large ovarian cyst, and a great deal of damage had been done although there was no actual rupture. The only case I have lost in Cesarean section was one in which I was told forceps had not been employed. I did a celiohysterectomy. I examined the baby and found that the head was marked and bruised. The case died from infection. I never feel safe in doing Cesarean section unless the uterus is examined for injuries, in all cases when delivery has been attempted by forceps. If the infected uterus is removed there is a better chance for recovery.

DR. JOHN C. HIRST.—I think Dr. Norris hit the nail on the head when he said that we cannot yet choose any operation applicable to all cases under all circumstances.

One word against the opening of the uterus *in situ*. I do not believe it is possible to protect the abdominal cavity from contamination from liquor amni in anything like the manner it can be protected when the uterus is properly padded off. When we come then to sponge out the part we find there is not much to sponge.

Only recently have we taken up the extraperitoneal Cesarean section. Adding the forty-eight cases I have operated on in my brother's absence, we have had 179 Cesarean sections, mostly of the classic type, in all of which, except the last few the extraperitoneal method was followed. In the infected cases we have done hysterectomy. In the extraperitoneal treatment of the stump sutures have been used instead of pins. In Germany the extraperitoneal Cesarean section has been done sufficiently to form some definite idea of the mortality. In a good many hundred the average mortality is between 6 and 8 per cent. This is a far better result in the infected cases than can be obtained by any of the other classic methods with the technic used abroad. In England the mortality in these infected cases is between 17 and 19 per cent. The mortality in Germany is hardly one-third of that.

The extraperitoneal Cesarean section we are taking up now to test its value and we find the convalescence smoother than in any other form. The method seems more favorable than that of the other operations, not only in regard to the dangers but to the astonishing ease of convalescence.

One decided contraindication is placenta previa. If you do the extraperitoneal Cesarean section the amount of blood lost and the danger of postpartum hemorrhage is so great as to practically disqualify the operation. I am not willing to do it in that kind of a case. I shall, however, do it routinely in all cases where practicable and contrast our results.

DR. WILLIAM E. PARKE showed a specimen of an ovarian cyst removed yesterday, and said: "The main interest attaches to the diagnosis before operation was done. It was a very lobulated tumor with a twisted pedicle and was very hard and nodular before some of the fluid leaked out of it. All who saw the patient before the operation thought it was a fibroid tumor. I had no doubt of it myself. At operation we found this tumor weighing something over 13 pounds. The patient is about forty-three years of age and had passed the menopause a year ago. The tumor had been known to be present for about four years."

"I had hoped to have here another specimen of a tumor which I removed a short time ago in which precisely opposite conditions obtained. Diagnosis had been made of ovarian cyst and at operation it was found that a tumor the size of a grape fruit had grown from the cervix between the layers of the broad ligament. That tumor although a fibroid was quite soft and even after the abdomen was opened it was still thought to be a cyst. Not until I opened the broad ligament did I find that it was a simple fibroid tumor."

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## REVIEWS.

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A REFERENCE HANDBOOK OF THE MEDICAL SCIENCES, embracing the entire range of Scientific and Practical Medicine and Allied Sciences. By various writers. Third edition, completely revised and rewritten. Edited by THOMAS LATHROP STEDMAN, A. M., M. D. Complete in eight volumes. Volume one. Illustrated by numerous chromolithographs and 611 fine half-tone and wood engravings. 936 pages. Imperial quarto. The set: muslin, \$56.00; leather, \$64.00; half-morocco, \$72.00 (subscription). Wm. Wood & Co. Publishers, New York.

This encyclopedia is a whole library in itself and in the reviewer's experience has proved of the greatest practical value for rapid reference to any subject in the field of medicine. Indeed, should the reviewer have to save only eight volumes out of his working library these volumes would be the ones chosen. That this opinion of its usefulness is shared by many others is proved by the enormous sales

of the two previous editions. The first edition was completed in 1887, the second in 1904, both under the able editorship of Dr. Albert H. Buck. Dr. Buck being reluctant to undertake the labor of seeing a third edition through the press, Dr. Thomas L. Stedman, well-known as the editor of the *Medical Record* and the author of a noteworthy medical dictionary, was chosen for the task.

The present edition follows the general plan of the original work, but Dr. Stedman, profiting by the fact that the original plates have been destroyed, has extended its scope and introduced several new features. Not only have the articles of the second edition been thoroughly revised or entirely rewritten, but numerous treatises on new subjects have been added. Numerous short articles on subjects not calling for encyclopedic treatment, yet demanding more than a mere definition, have been included. The cross-references have been largely extended, in many cases thus affording all the information desired by the consultor without the necessity of searching through the main article. Considerable space has been given to the history of medicine and, in line with this, brief biographies of the leaders in medical thought and progress have been introduced.

The first volume contains within its 936 pages the titles from A to Bacteriuria. The paper is a semi-matte which shows the cuts well but is not shiny nor trying to the eyes. The printing and binding is well done.

**A TEXT-BOOK OF OBSTETRICS: INCLUDING RELATED GYNECOLOGICAL OPERATIONS.** By BARTON COOKE HIRST, M. D., Professor of Obstetrics in the University of Pennsylvania. Seventh Revised Edition. With 895 illustrations, 53 of them in color. \$5.00. Philadelphia and London: W. B. Saunders Company, 1912.

In the present edition, as in previous ones, Dr. Hirst has included a discussion of gynecological conditions as a necessary adjunct to the study of obstetrics, for he believes that the consequences of child-bearing constitute the vast majority of the diseases of women and are therefore possible complications of the generative processes. Dr. Hirst is convinced that the best method of dealing with the subject is to dispense with a separate department for teaching diseases of women and that obstetrics and gynecology should be combined. Although this seems logical, it is doubtful, with the great advances in both fields, whether the whole subject can be sufficiently taken care of in this manner.

In the present edition an innovation is the extension of the article on diseases of the mammary gland, which the author believes should become part of the obstetrician's specialty, as the latter has an opportunity of acquiring experience in diagnosis and skill in treatment of these conditions that no general surgeon can rival.

Some of the older illustrations, used in previous editions, have fortunately been discarded, and this revision might have been extended to a number of others, but as a whole, the printing and illustrating of Dr. Hirst's book is very satisfactory, and the work

will constitute as heretofore, a very important member of the group of modern American text-books.

A PRACTICAL TEXT-BOOK OF THE DISEASES OF WOMEN. By ARTHUR H. N. LEWERS, M. D. Lond., F. R. C. P. Lond., Seventh Edition. With 258 illustrations, 13 colored plates, 5 plates in black and white, and a large number of illustrative cases. Price \$4.00. Paul B. Hoeber, New York, 1912.

The present edition of Dr. Lewer's book has been considerably enlarged to adapt it to recent requirements. The book is essentially clinical and practical and has been very extensively employed in England as a manual of instruction for medical students. The author is well known as a member of the staff of the London Hospital where he has been in service for a period of twenty-seven years and consequently in a position to incorporate a great many personal and original views in his book. He has adapted a method of illustrating his views on various subjects by the recital and illustration of cases met with in his personal practice. Whether this in a student's text-book is to be commended, will remain a matter of contention, as a mere statement of fact is often more valuable in presenting a recognized subject than a recital of the details. However, the book may be commended as including within its comparatively small dimensions an excellent presentation of the entire subject of gynecology, in which due credit is given to American workers in this field. The illustrations and printing are very generally satisfactory.

MEDICAL MEN AND THE LAW.—A treatise on the Legal Rights, Duties and Liabilities of Physicians and Surgeons. By HUGH EMMET CULBERTSON, Esq., member of the Ohio and New York Bars; Contributing Editor to many Legal Publications. Octavo, 325 pages. Cloth, \$3.00. Lea & Febiger, Philadelphia and New York, 1913.

This book deals with the duties, rights and liabilities of the professional man toward the public as settled by law, and with the legal relations of the profession to irregular practitioners as well as the status of such in the eyes of the law. Every medical man should know the multitude of points in which his relations to the public and his fellow practitioners are subject to a well-settled body of law, to the end that he may avoid unexpected trouble on the one hand and know his rights and powers on the other. The well-established physician who has bought this knowledge in the costly school of experience will appreciate the value of such a work and will give it a place in his library within easy reach for frequent consultation. The young physician will be wise to profit by the knowledge so conveniently placed at hand and will be glad to avoid the trials and troubles of his elders. The work is comprehensive and authoritative. There are chapters on who may practise medicine and surgery, on relations of physician to patient, on compensation,

malpractice or negligence, criminal liability, exemptions, witnesses, right to protect professional reputation, validity of contract restricting exercise of profession, and wills.

VACCINE THERAPY, Its Theory and Practice. By R. W. ALLEN, M. D., B. S. (Lond.), Late Clinical Pathologist to the Mount Vernon Hospital for Disease of the Chest; Late Pathologist to the Royal Eye Hospital; Late Gull Student of Pathology, Guy's Hospital. Fourth edition. Pages 443, octavo. Philadelphia: P. Blakiston's Son Co., 1913, \$3.00.

The rapid advances in the theory and practice of vaccine therapy during the last three years have necessitated the complete rewriting of this book. As it now appears it is a systematic account of the antibodies and immunity, of the opsonic index and its value in diagnosis, prognosis and treatment, of the methods of preparation and administration of vaccines, of the rationale of vaccine treatment and the causes of failure, of diseases in which it may be used and the technic of its employment. Its subject matter is well arranged, clearly written, authoritative and up to date.

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## ITEM.

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### THE CLINICAL FACILITIES OF NEW YORK CITY.

"A Society for the Advancement of Clinical Study has recently been organized in New York City, the purpose of which is to maintain a bureau of information which will furnish to resident and visiting physicians definite information regarding the clinical facilities of the hospitals and laboratories of the greater city. For this purpose a bulletin board has been installed at the Academy of Medicine, 19 West Forty-third Street, in charge of a special clerk who will be on duty between the hours of nine and six to answer all telephone inquiries (Telephone 974 Bryant). The bulletin board will consist of two sections, on one of which will be posted month by month, the regular clinics, medical and surgical, and also laboratory demonstrations, all of which are held at stated hours. The second section will include full announcements of daily operations and demonstrations of cases both medical and surgical, which as far as possible will be announced on the day preceding their performance. It is believed that these facilities will afford physicians who are interested in observing particular operations and operators or clinicians, an opportunity to obtain the desired end with the least trouble. It is hoped that by this means the large and unexcelled clinical facilities of New York City will be made more accessible to those who may desire to make use of them."



## BRIEF OF CURRENT LITERATURE.

## OBSTETRICS.

**The Theoretical Basis for the Prophylactic Treatment of Eclampsia.**—Stroganoff (*Zentralbl. f. Gynäk.*, Nov. 9, 1912) presents a communication based on a series of 839 cases which have been treated by this method. He believes that as the etiology of eclampsia is still unknown, we cannot adopt any method of treatment directed toward the cause of the condition, and claims that the prophylactic methods have thus far afforded the best results, not only as regards the mother but also the child. As they have been tried out in a large and varied series of cases, it is impossible to ascribe this result to chance. If the theory be true that this disturbance of pregnancy results from an irritant, the prophylactic method appears entirely rational, although this may also be extended to include the point of view of those who assume it to be a toxemia. The action of chloral hydrate in eclampsia may be likened to that of the so-called physiological antagonist in poisoning. The mixture of various narcotics increases their potency, so that by this means we are able to employ smaller doses and thus to reduce the toxic effect of the individual drugs.

**Facial Paralysis After a Spontaneous Labor.**—Carlsson (*Zentralbl. f. Gynäk.*, Nov. 9, 1912) discusses the frequency with which this condition occurs, and from a study of about thirty cases, comes the following conclusions: The paralysis is almost always a peripheral one and is due to pressure on the nerve root in the immediate vicinity of its point of exit through the stylomastoid foramen. In the majority of cases this injury is produced by the pressure of the symphysis, and in a smaller number by the sacral promontory. Thus far the paralysis has almost always been observed in cases of greatly contracted pelvis, and on the average lasts about eight days.

**Streptococci in the Vaginal Secretion During Pregnancy.**—Joeten (*Zentralbl. f. Gynäk.*, Nov. 16, 1912) discusses the question whether hemolytic streptococci have any particular significance in pregnancy. For this purpose he studied the secretion of one hundred pregnant women who had not been subjected to any previous vaginal examination, for the presence of these organisms. In sixty-seven cases these were found in bouillon cultures but in only one instance did the patient develop a rise of temperature. In fourteen of the sixty-seven a typical hemolysis could be demonstrated. In comparison with these there was a series of fifty-three cases in which a rise of temperature occurred in seven. The examination of the lochia of twenty puerperal women who were free from fever, showed that in fourteen cases typical hemolytic streptococci were found without apparently producing any disturbance. It would appear

therefore from these observations that no pathogenic significance either during pregnancy or the puerperium can be attached to the presence of hemolytic streptococci. Hemolysis is in itself not a pathogenic property and must be regarded as of some other unknown significance.

**Abstraction of Colostrum in Eclampsia.**—Walcher (*Zentralbl. f. Gyn.*, Oct. 26, 1912) in a discussion of Sellheim's theory that eclampsia is of mammary origin, reports the results of his experience in eleven cases in each of which the colostrum was removed from the breasts after a convulsion, by manual compression, and in a number of cases infusions of salt solutions were employed and frequently doses of morphine were also given. Out of the eleven cases one died, in which a forceps delivery was employed. A vaginal Cesarean section was done in one case and labor was induced in three, no information being given as regards the delivery in the remainder. In view of the apparently good effect in eclampsia the author advises the removal of the colostrum as a routine procedure.

**X-ray Diagnosis in Obstetrics.**—Ryner (*Zentralbl. f. Gyn.*, Oct. 12, 1912) believes that the value of the x-ray for diagnostic purposes extends in two directions: one by affording a more definite knowledge of the form of the pelvis and its diameters, and second, by determining the position of the child in its relation to the pelvis, and the diagnosis of multiple pregnancy. The author relates the histories of twenty-one personal cases, and details the sources of error that are liable to occur in this procedure. He considers, however, that in doubtful cases the method constitutes the valuable means of diagnosis, especially as regards the position of the extremities of the child. The recognition of a twin pregnancy as well as occiput posterior positions may likewise be definitely determined. Moreover, the fronto-occipital diameter of the head in the presentation may be mathematically determined by taking the picture with the patient on the side. The intrauterine diagnosis of monsters and that of extrauterine pregnancy is still unsatisfactory, but the positive diagnosis of pregnancy in doubtful cases may be aided by an x-ray examination.

**The Treatment of Placenta Previa with Hypophyseal Extracts.**—Trapl (*Monatschr. f. Geburtsh. u. Gynäk.*, Oct., 1912) reports an experience with sixteen cases of placenta previa treated with pituitrin, among which subsequent labors were favorable for the mother and in only one case did an atonic condition of the uterus develop. Thirteen living children were born, of which two died subsequently of inanition. Three children were born dead, two of which were found to have died before the pituitrin was employed. Out of the fourteen cases in which the children were alive, there were three cases of marginal, ten of lateral, and one of central placenta previa. In one case where a fetal death resulted, this occurred four hours after the injection and it is doubtful therefore whether it was due to the same. The course

of the labor was accelerated in the majority of the cases. The author's recommendations are as follows: If only a small portion of the placenta presents, and especially if a vertex is present and the labor has advanced to such an extent that the cervix is shortened and sufficiently open, then the membranes are ruptured and pituitrin given. This method is best adapted for those cases in which a marginal variety of placenta previa is present, because if a larger segment presents, the engagement of the head is interfered with. In other cases the author recommends combined version with the injection of pituitrin. The resulting labor pains force the breech against the loosened segment of the placenta, and the completion of the delivery may be safely awaited, no attempts at extraction being necessary except that directed to the arms and the head. In cases where dilatation is not sufficient to admit combined version, a small dilating bag may be inserted or a vaginal tampon applied, after this becomes sufficiently dilated, then a combined version with an injection of pituitrin follows.

**Sterility Treated by Thyroid Preparations.**—Weil (*München. med. Wchnschr.*, Oct. 15, 1912) reports his observations in three cases in which a combination of thyroid extract and iodine was employed. The first case presented a goiter and remained sterile four years after marriage. The iodothyron tablets were given for three months, at the end of which the menstruation stopped, and the woman subsequently gave birth to a full-term child. The administration was resumed on account of the disturbance from the goiter and pregnancy again occurred on two occasions. The second patient had been sterile for seven years without any anatomic reason for the same. The thyroid was slightly enlarged. The thyroid preparation was given for three months when the patient became pregnant and aborted four months later. In the third case the woman had been sterile for three years, and aside from a slight swelling of the thyroid, presented no abnormalities. The iodothyron was likewise administered and after a period of several months the patient became pregnant. In each of these cases the administration was stopped as soon as the menstruation ceased. Weil believes that in certain cases sterility is due to a disturbance of the hormone action of the thyroid on the ovaries and that by the administration of such preparations a favorable stimulating influence on these organs is exerted.

**The Thyroid in Pregnancy and the Puerperium.**—Markoe and Wing (*Bull. Lying-in Hosp., N. Y.*, vol. viii, No. 4) report in detail their observations upon a series of 1000 pregnant women which were entered upon a special form of analytical chart. Freund and Lange in a recent communication stated that they were unable to formulate any definite rules for measuring the thyroid gland, owing to the impossibility of devising a method that would be accurate. Markoe and Wing agree that a careful study of their cases where the thyroid was palpable, shows that

the results were no more satisfactory. It was found, moreover, that in most of the women examined, no definite means of judging the time when their necks first began to enlarge could be elicited. In a study of the blood examinations made in most of the cases, there was a small percentage of abnormalities, but these could be accounted for by pathological conditions in no way connected with the thyroid. Most careful analyses of the urine were made in all cases with negative results, likewise no definite deductions could be made out in regard to the thyroid in its relation to toxemia. Among the 1000 cases examined, 550 were primiparæ and 450 multiparæ. Ninety-seven cases of enlarged thyroids were found in sixty-four primiparæ and thirty-three multiparæ. A family history of goiter was present in eight cases (seven primiparæ and one multipara). In six primiparæ there was a history of menstrual disturbance. Hyperthyroidism was present in varying degrees in seven cases, and probably in one other case, although there was no palpable thyroid evident. In an endeavor to find out at what time the enlargement of the thyroid was first noticed among ninety-seven cases, it was seen before pregnancy in twelve, and during pregnancy in eighteen, thirty-four remaining doubtful as the patients had not observed any changes in their necks, although when observed at term the gland was found enlarged. In multiparæ the enlargement was determined before pregnancy in eight cases, during pregnancy in twelve, and doubtful in thirteen—the same remarks applied to the latter as in the cases of the primiparæ.

**The Development of the Fetus in its Relation to the Length of Pregnancy.**—Hannes (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxi., Heft. 3) presents a study based on 12,866 labors in the Breslau Clinic, among which were 362 children with a minimum weight of 4000 grams. Of these, 327 weighed between 4000 and 4500 grams and two over 5000 grams. The length of these infants varied between 49 and 59 centimeters. In forty-eight out of the 362 cases the mothers were unable to furnish any details of their last menstruation and in the remainder, in which this could be determined with more or less accuracy, 50 per cent. were found to have carried the child over 280 days. In order to determine whether these large children were carried for a longer period than the others, a comparison was made with 561 full-term children which weighed between 3000 and 4000 grams, as a result of which it was found that among these, 46 per cent. had been carried longer than 280 days. The statistics also show that among the large babies 14 per cent. reached their excessive development during a more or less shortened period of pregnancy, whereas 11.7 per cent. were carried more than 300 days. It was also found that among the normally developed children twenty-one had reached an average growth in less than the usual term, and 7 per cent. had been carried over 300 days. Hannes thinks that in Germany it would be desirable therefore to extend the legal consideration of full-term pregnancy to at least 320 days.

**The Intrauterine Recognition of Sex.**—Pankow (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxii., Heft 1) presents an interesting study of attempts to differentiate the sex of the fetus in the last months of pregnancy, which is based on the supposition that the embryonic testicles, being glandular organs, secrete substances which may be demonstrated in the blood of a woman pregnant with a male fetus. The absence of this reaction would then tend to show that a female child was present. For this purpose Pankow employed the precipitin reaction which is based on the fact that the blood serum of experimental animals previously treated with vegetables or animal albumin, developed specific reaction products (precipitins), which when brought together with the albumin solution already employed give rise to a precipitation. The author first attempted to demonstrate whether with the aid of the testicular extract, differences could be shown between the male and female blood. It seemed as if the testicular juice when brought into contact with the blood serum of the same species resulted in a precipitation, and it was also found that the serum of a bull produced a more marked reaction than that of a cow. In another series of experiments made with guinea-pigs the intraperitoneal injection of testicular juice resulted in the death of the animals within twenty-four hours, owing to the toxic action of the same, but in every case where the animals were injected with material which had been previously inactivated, a marked lowering of the temperature occurred but otherwise there was no change. Pankow formulates his results as follows: Foreign testicular substances when injected intraperitoneally manifest an extraordinarily toxic effect on the animal organism. The toxic action is produced by the complement which, however, may be obviated by inactivation. By preliminary treatment with normal as well as with inactivated testicular substance, antibodies are formed in the blood of the experimental animal which produce precipitation with those of the serum of the first variety. The production of antibodies which are specific only against the serum of the bull, by producing treatment with testicular substance has thus far not been possible. It is noteworthy that the direct contact of a solution of testicular juice with bull serum brings about a delayed, but well-marked reaction. Anaphylaxis is entirely without results in the attempt to differentiate sex by the blood. Although the author's experiments are generally negative in their results, he believes that this is largely due to the fact that our methods of differentiating albumins are not sufficiently developed, but that when this is attained the difference in sex may probably be determined in the manner indicated.

**Pathogenesis and Prophylaxis of Placental Lesions in Albuminuria and Eclampsia.**—M. V. Wallich (*Bull. de la Soc. d'obst. et de gyn. de Paris*, June, 1912) believes that in eclampsia it is the mechanical effect of hypertension of the blood-vessels in the intoxicated that causes changes in the placenta. In injecting a



gravid uterus in a woman who died from eclampsia he observed that the gelatin found spaces where it accumulated, similar to the hematomata of eclampsia in their location, among the villi, where there is a syncytial layer of a very delicate nature and easily ruptured. If this becomes slightly altered the endothelium is modified and permits osmosis of substances that favor coagulation. Increased pressure in the blood-vessels also favors the passage of blood, and thrombosis occurs. Prophylactic measures would include the treatment of blood tension throughout pregnancy, whether albumin is present or not. This toxic hypertension must be combated by diet, changes in the amount of liquid taken, purgation and venesection.

**Pyelonephritis of Pregnancy and the Puerperium.**—J. W. O'Connor (*Bost. Med. and Surg. Jour.*, 1912, clxvii, 652) states that infection of the pelvis of the kidney invariably involves the parenchyma. Owing to its anatomical relations the right kidney is the more vulnerable. The disease is much more frequent than supposed; the writer estimates that it occurs once in every 3000 cases. Malnutrition, constipation, and tonicity of the abdominal muscles are predisposing factors; tendency to renal abnormalities on the right, dextrotorsion of the uterus and predominance of positions in the right oblique diameter favor the infection of the right kidney. Infection by the colon bacillus is the most common type, direct transmission through the intestinal walls being the probable mode of entrance. The pathological picture shows the pelvis and ureter dilated with pus and miliary abscesses in and beneath the cortex. The cardinal symptoms are smarting micturition, chills, fever, nausea and vomiting, pain in the loin and elevation of pulse. The urine is turbid, purulent and albuminous. Tenderness in the region of the kidney is always present. Enlargement of the organ can be demonstrated in about one-fifth of the cases. Abortion and surgical kidney are the most common complications. The diagnosis can generally be made on physical signs and urine analysis, the differentiation from appendicitis presenting the greatest difficulty. Prognosis is usually good for the mother and less favorable for the child. Treatment by rest, sedation, catharsis and urinary antisepsis has met with success. The use of vaccines and pelvic lavage, if of any real value at all, entails dangerous delays and, being extremely technical, is beyond the scope of the rank and file of the profession. Early operation in cases that assume a surgical aspect is to be strongly recommended.

**Eclampsia, with Reference to Seasonal Incidence.**—J. H. Croom (*Edin. Med. Jour.*, 1912, n.s. ix, 418) attempts to show from the statistics of the Edinburgh Maternity Hospital that eclampsia is increasing, and that the mortality is decreasing. The tables of this hospital and other sources show an enormous diversity of opinion, but judging from the records of the Edinburgh Maternity Hospital, It may be argued fairly conclusively that as an etiological factor seasonal change is scarcely worth consideration,



and that the difference is really due, not to the change from summer to winter, but to a sudden alteration in the temperature and rainfall, irrespective of any particular season.

**Death of the Fetus in Hydatidiform Mole.**—H. Keiffer (*Bull. de la Soc. Belge de gyn.*, xxii, No. 4, 1912) gives the results of the comparative study of a hydatidiform mole and the fetus of an abortion at five months. The mole was sterile, presented no trace of amnion, and was expelled after a series of hemorrhages. It was formed in the first pregnancy, the father having been syphilitic. The next pregnancy resulted in a delivery at term, after treatment for syphilis. The mole was of the typical form of the bunch of grapes. It was expelled at the fifth month, after rest for three months, which caused its retention in the uterus. The mole resulted from normal development up to the sixth week, death taking place as a result of profound alterations of the placenta. Successive hemorrhages separated it from the uterus. There being no nourishment of the fetus, changes of a degenerative nature then began, the epidermis degenerating into pedunculated cysts. The succession of pathological processes is clearly shown in this specimen embryo, cord, and amniotic cavity disappearing entirely, and only a few chorionic villi remaining to show the nature of the mass. The formation of the hydatidiform mole seems to be due to a microbic or other intoxication. The alteration is confined to the embryo, not affecting the uterine mucosa.

**Pituitary Extract as an Oxytocic.**—A. Bonnet-Laborderie and H. Fourdinier (*Jour. des sci. méd. de Lille*, Aug. 31, 1912) state that it is the extract of the posterior portion of the pituitary body that has an effect on the uterine muscle. It may be administered in the form of powder of the fresh gland, or of a solution of pituitrin injected under the skin. The dose is as yet a matter of experiment. In France it is used in smaller doses than in Germany, not more than 3 c.c. being used at one time. In the experience of the author the effect of the extract is seen fifteen minutes after its use, and increases for an hour afterward, then gradually passes off. The contractions are normal in intensity, duration and frequency. They are neither violent nor spasmodic, and do not endanger the life of the child as does ergot. Cardio-vascular symptoms, consisting of vertigo, tachycardia, and distress in respiration, resulting from the use of pituitrin, have recently been reported by writers who believe that we should never use pituitrin in patients who have heart trouble. Labor was rapid in the author's case, and there was no accompanying hemorrhage.

**Puerperal Fever.**—In the Ingleby Lecture, J. F. Jordan (*Med. Press*, July 10, 1910) suggests giving to every woman at the commencement of labor an injection of the vaccine of a streptococcus puerperalis, with the idea that she will be thus rendered immune to infection in 70 or 80 per cent. of the cases. A vaccine prepared from the bacillus coli might also be used.

**Rare Form of Postpuerperal Septicemia from Streptococci.—**

Bonnaire and C. Durante (*Jour. de méd. de Paris*, Aug. 31, 1912) record a form of septicemia occurring in the puerperal woman in which the uterus is found almost intact at autopsy, and yet in which there are purulent lesions of the pleura, from which the patient dies. The characteristics of this form of disease are the regularity of the temperature, and chills which occur at the same hour of the day, while the spleen is much enlarged. No infection of the uterus or pelvic veins was found at autopsy, and no endocarditis. There were streptococci in the pleural false membrane.

**Remote Prognosis of Albuminuria in Pregnant Women.—G.**

Lepage (*Ann. de gyn. et d'obst.*, Oct., 1912) says that after a woman has had severe kidney disturbances with one pregnancy, especially if the child has died, it becomes of importance to know whether the same condition is likely to supervene in each succeeding pregnancy. When albuminuria is slight and occurs late in pregnancy there is no danger of its repetition. If there have been no worse consequences than a premature expulsion of the fetus, danger is small. The author has collected from the records of the Baudelocque Clinic, cases of twenty-two primiparæ, and eleven multiparæ, all of whom had attacks of eclampsia. Of the primiparæ, seventeen had later pregnancies without convulsions; eight of them did not have subsequent albuminuria, and their children were born alive; eight others had living children in spite of albuminuria; five had attacks of eclampsia in a later pregnancy; and one had albuminuria and a macerated fetus. Of the eleven multiparæ, nine had no return of eclampsia in the next pregnancy, while two had it in a second one. Eclampsia in a primiparæ is of less grave prognosis in later pregnancies than in multiparæ. Good hygiene and diet will prevent eclampsia in many cases.

## GYNECOLOGY AND ABDOMINAL SURGERY.

**Ureteroappendiceal Anastomosis.—B. Kennedy (*Surg., Gyn.***

*and Obst.*, 1912, xv, 464) finds, by work upon the cadaver and dogs, that the right ureter may be planted with ease into either the tip or base of the appendix and the transplantation of the left ureter into the appendix, with or without transplantation of the right ureter, in those cases with appendices and meso-appendices of average or fair length, may be accomplished without the production of kinking or undue traction to endanger blood supply or drainage. The absence of strictures and the permeability of the lumen of the appendix into the cecum must be demonstrated by the introduction of a sound. The advantage claimed for the operation of transplanting the ureter into the appendix vermiformis in preference to transplanting the ureter into the colon is the relatively cleaner receptacle offered by the

appendix as compared with the colon, for the implantation of the ureter, and the greatly reduced possibility of ascending infection.

**Paget's Disease of the Breast.**—Reporting two cases and reviewing the literature, F. E. McKenty (*Surg., Gyn. and Obst.*, 1912, xv, 457) says that Paget's disease of the breast is due to chronic irritation. The source of the irritant arises in the breast itself (alteration of secretion in the involuting acini). Complete removal of the breast is the only treatment, and should be undertaken early.

**Myomectomy.**—Schöpp, of Menge's Clinic at Heidelberg (*Monatschr. f. Geburtsh. u. Gynäk.*, Nov., 1912) presents a careful study of sixty cases, as the result of which he warmly recommends this operation, especially in young women who have remained sterile or habitually abort. Even in older people the conservative method was believed to be simpler and more rational than the radical operation. The postoperative morality in this series amounted to 3.33 per cent. Seventy per cent. of the patients were free from all symptoms several years after operation and seven subsequently became pregnant. In two cases the enucleation was done during pregnancy with good results for both mother and child. Among forty-five cases which were subsequently examined, recurrences were noted in four (9 per cent.). Schöpp believes, however, that the latter fact is not to be regarded as an objection, because by means of the x-ray, undiscovered foci of fibroid tumors may be satisfactorily done away with.

**The Treatment of Amenorrhea.**—Fromme (*Zentralbl. f. Gyn.*, Oct. 12, 1912) discusses the cases in which this condition is present for prolonged periods without pregnancy. Thus far the treatment in such instances has been unsatisfactory, and in view of a possible disturbance of the internal secretory glands being at the bottom of the amenorrhea, Fromme suggested injection of hypophyseal extract. He employed doses of 1 c.c. daily until a result was obtained, or the method was found without effect after several weeks trial. Of twelve cases thus treated, five were without result, two were doubtful and five reacted promptly. The writer believes that those patients are most suitable for this treatment in whom a well-marked adiposity is present and in whom disturbances of the internal secretions are most likely. In view of the uncertainty of the effect of these substances, its further recommendation must, however, be held in abeyance.

**The Internal Secretion of the Corpus Luteum.**—Kiutsi (*Monatschr. f. Geburtsh. u. Gynäk.*, Oct., 1912) has made use of a special method for isolating the specific tissue substances of this body by separating the yellow structure from the surrounding connecting tissue and rubbing it up with sand and distilled water. The resulting mass was then extracted with salt solution and its coagulating effect on human blood studied. In every instance the coagulation of the latter was immediately hastened. Kiutsi believes that during normal ovulation the coagulation of the blood

is favored by the luteum cells which are freed during the rupture of the Graafian follicle, it being possible that the substances enter the blood stream and bring about a cessation of the menstrual discharge. In studying the biology of the corpus luteum, he considers necessary a complete isolation of this body from the surrounding tissue elements.

**Physiological Influence of Ovarian Secretion.**—A. L. McIlroy (Proc. Roy. Soc. Med., Obst. and Gyn. Sect., 1912, v, 342) discusses this subject theoretically and describes her own experiments which led to the following conclusions: The ovary controls the nutrition of the uterus and other reproductive organs, since removal of both ovaries causes atrophy of the muscular and glandular elements of the uterus, etc., the degree of atrophy being in direct proportion to the length of time which has elapsed since the operation. There is also a diminution in the uterine blood-vessels, and a tendency to atheroma—a condition very closely allied to fibrosis of the uterus in the human subject. Menstruation and estrus do not occur after complete removal of both ovaries. In young animals after oophorectomy the infantile type is maintained. Removal of the uterus, or retention of uterine secretion, does not affect the functional development of the ovaries, seeing that the elements of the ovary are well preserved after hysterectomy and ligation of the uterine horns. Retained uterine fluid does not counteract the atrophy of the uterus which takes place after removal of both ovaries. There is thinning out of the uterine wall at the point of greatest distention, and no compensatory hypertrophy has been observed. Removal of one ovary causes compensatory hypertrophy of the other in the anestrus state. That the interstitial cells perform the chief rôle in the maintenance of the nutrition of the uterus is evidenced by (a) the survival of these cells in grafted ovaries, (b) the follicles becoming absorbed or cystic, and (c) the fact that no atrophy of the uterus occurs when these cells are present. The interstitial cells become functionally active during proestrus, as shown by their being enlarged and their cytoplasm becoming infiltrated with a lipoid substance (in female dog). That the corpus luteum is the part of the ovary which exerts the most active influence upon the body as a whole is shown by the fact that corpus luteum extract, when injected, causes rise of the general blood pressure. From the result of one experiment it was found that the ovaries do not play such an important part in the elimination of calcium as is supposed, since after castration the calcium output was increased, whereas it was diminished as the result of administration of corpus luteum extract. Removal of the ovaries in rabbits causes an increased deposit of fat in the tissues of the body.

**Coliform Organisms in the Healthy and Infected Urinary Tract of the Female.**—In presenting a study of this form of infection, R. S. Williams, H. L. Murray and A. J. Wallace (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxii, 65) state that typical bacillus coli is found in a considerable percentage of female urines taken

under conditions precluding all source of contamination. Ordinarily they have no apparent pathological significance. Although in the writers' cases culturally identical, agglutination reactions prove that there are wide biological differences between the various strains isolated. As male urines very rarely show the presence of this organism, it is reasonable to suppose that the usual path of entry is by way of the perineum and urethra. When infection of the urinary tract is present the coliform organisms isolated show great variation in cultural reactions. Vaccines therefore should be autogenous, and since the same case may show the presence of more than one organism, vaccines should be prepared from many colonies. Vaccine treatment of coliform infections is of pronounced benefit. In acute cases, if due care be taken and the doses and intervals carefully regulated, a very marked improvement can be very speedily produced in the vast majority of cases; but, to obtain this, very close supervision is necessary. A first dose in acute cases should never exceed 10 millions, the intervals must be short and, if there be any doubt, opsonic indices should be taken. Subacute or chronic inflammations are equally hopeful, provided that the doses are suitably increased, that it is appreciated that the treatment should be coterminous with the presence of pus in the urine, and that this may be a somewhat lengthy process. Cure does not necessarily imply the sterilization of the urine.

**Retrodisplacement of the Uterus Treated by Gilliam Method of Round Ligament Suspension.**—W. D. Macfarlane's (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxii, 80) paper is based on 140 cases, forty of which are excluded because only recently operated upon. In three cases the round ligaments were found to be too slender for suspension and in two cases they were torn during operation. There were no deaths; convalescence was as rapid as after other forms of suspension. One case of thrombosis with recovery and one recurrence of the displacement are recorded. Sixteen of the cases operated upon became pregnant, and no difficulty was experienced at the time of delivery. One case aborted at the third month, and another at the sixth month as the result of hyperpyrexia in connection with a febrile attack of unascertained cause. The uterus in every case involuted normally, and there was no recurrence of the displacement. In the early months of pregnancy all the patients complained of pain due to the stretching of the ligaments; this continued in the majority till the end of the fourth month and after this period the pain subsided. Bladder irritability was complained of in three cases. All the cases of mobile retroflexion were cured of the symptoms complained of and remain well. Those cases in which there were marked adhesions and evidence of chronic inflammatory mischief obtained complete relief of their symptoms in 85 per cent. In 10 per cent. there was still some pain, but this proportion is not unusual; 5 per cent. obtained no relief.

**Prevention of Peritoneal Infection after Operation.**—P. Lecène (*Ann. de gyn. et l'obst.*, Sept. and Oct., 1912) mentions, as means for the prevention of infection of the peritoneum after operation on the abdomen, careful choice of the moment for operation, and of the extent of operation to be performed in each case; systematic use of sterilized rubber gloves; strict asepsis during the operation, with limitation of the field of operation; exact peritonization of the bleeding surfaces with or without exclusion of the small pelvis; and careful judgment as to the indications for drainage and the methods when it is needed.

**Embryonic Bands and Membranes about the Cecum.**—Some four years ago, under the name of membranous pericolicitis, Jackson called attention to what he believed was a distinct form of pericolicitis, a definite pathological and clinical entity, characterized by the formation of an entirely new layer of vascularized peritoneum, which is found usually on the ascending colon, often extending up to the hepatic flexure and over onto the transverse colon. The symptoms are classified with those occurring in some cases of chronic appendicitis. There is a wide divergence in the opinions as to the origin and nature of the membranes. Suggestions varying from folds of peritoneum caused by the cecum burrowing behind the parietal peritoneum in a delayed descent, and acquired adhesions to prevent the ptosis of the cecum, to various inflammatory or infectious etiological factors, have been given as the essential basis of their formation. J. M. Flint (*Johns Hopk. Med. Bull.*, 1912, No. 260, 302) has met with twenty-nine instances where pericolic membranes were found at operation. They are fine, delicate membranes extending over the surface of the first part of the large intestine, which is freely movable under them. The cobweb veil is very thin and is covered by glistening peritoneum and contains numerous characteristic parallel blood-vessels, which run for a considerable distance without anastomosing. They originate from the vessels of the parietal peritoneum and usually run downward and forward to terminate by communicating with the vessels in the muscular coat of the intestine. The attachments of the membranes to both the parietal peritoneum and the intestine are extremely loose and elastic. Here and there, there are firmer strands of connective tissue and the veil terminates usually by spreading out in fan-shaped processes or extensions as it insensibly loses itself in the peritoneal surface of the intestine. The membranes are paper thin and only now and then do they show any deposits of fat. The impression given by them is quite different from that ordinarily conveyed by pathological adhesions. The writer has dissected a series of human embryos and two infants at term. He says that not only from the appearance of the veils themselves, but from the conditions shown in the human embryos and infants just described, it is clear that these pericolic membranes are not the products of inflammation, nor are they the residue of repeated



attacks of colitis. It is likewise clear that the view which regards them as the result of a burrowing of the cecum behind the parietal peritoneum cannot obtain. They represent simply either more marked attachments of the large intestine to the posterior abdominal wall or else, in some cases, a more extensive fusion of the omentum to the colon, which is dragged down with the descent of the cecum and gives it an attachment on the ascending colon continuous with an embryonic membrane. While, in the great majority of cases, they are not the cause of any trouble, in certain instances, either alone or in combination with other circumstances, they may give rise to symptoms which are not infrequently either confounded with or associated with chronic appendicitis. Embryonic veils which embrace the appendix usually kink it, and probably are responsible for many of the cases of chronic appendicitis in which they occur. Veils of this type have usually been interpreted as adhesions about the appendix resulting from previous infections. Several suggestions have already been made for the treatment of these pericolic membranes. By some, the veils have been stripped off and the colon denuded of some of its peritoneum in consequence. Another suggestion has been to dissect off the veil and use it as a strand to support the cecum from sinking into the pelvis. Lately the author has simply incised the membrane along the lateral border of the colon and allowed the intestine to unroll and become free. Incision is all that is indicated, for any obstruction can be relieved in this way. Stripping leaves a denuded surface which may lead to the formation of adhesions or cause, in healing, the formation of a new inflammatory membrane which might be worse than the embryonic veil. The writer has met with eleven cases of Lane's band, of which five had also embryonic veils upon the cecum or ascending colon. In three instances, occurring in embryonic life and just after birth, there was not only a Lane's band present, but also the explanation of its formation. The band is associated with the fusion that takes place between the rotated intestine and the parietal peritoneum. The symptomatology has varied from none attributable to the band itself, but where the disease was chiefly in the appendix, to marked cases with definite obstruction. The treatment that has been followed by all surgeons consists in an incision of the band along the mesenteric border of the intestine, allowing the gut to unroll and the kink to straighten out. The study emphasizes that we should ascribe pathological significance to normal, but variable, structures with great hesitation. It is also essential to be familiar with the type variations of the different viscera.

# DEPARTMENT OF PEDIATRICS.

## ORIGINAL COMMUNICATIONS.

### RELATION OF THE WEIGHT CURVE OF THE INFANT TO THE FOOD.\*

BY

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(With Ten Charts.)

AN infant will thrive and gain weight on a varying amount of food. There is an amount which is just sufficient to prevent a loss; this is known as the minimum. The greatest amount which the infant can care for and not result in damage to the organism is known as the maximum. Overstepping this limit leads to a metabolic disturbance affecting all the cells of the body which is manifested by restlessness of the infant and a loss of weight. A continuation of this diet leads to the development of symptoms from the site of the gastrointestinal tract, loose, white or green stools, vomiting and fever. In our clinical work it is truly remarkable to observe how frequently we can stay the development of these gastrointestinal symptoms since our modern conception of the factors at work. The optimum of food or the amount which brings about the most satisfactory progress in the nutrition of the infant is an amount between the minimum and maximum. In health, particularly in the breast-fed baby, this limit is wide. The weight advances and the nutrition remains undisturbed in spite of the fact that little attention is paid to the caloric intake. In disease on the contrary this limit is so small that progress is made only after a most painstaking adjustment of the food.

Milk nutritional disorder of Czerney and balance disturbance of Finkelstein, which have been much discussed in pediatric literature in recent times, come about as a result of the prolonged administration of a diet which oversteps the maximum. In a given case

\* Read before the Medical Association of the Southwest, Hot Springs, Ark., Oct. 12, 1912.

the absolute number of calories may not be excessive but, owing to injurious factors present in the case, the baby's tolerance for food is lowered and we see the food instead of promoting nutrition, actually damaging the infantile organism. All those influences which bring about a lowering of the tolerance limit require our most serious

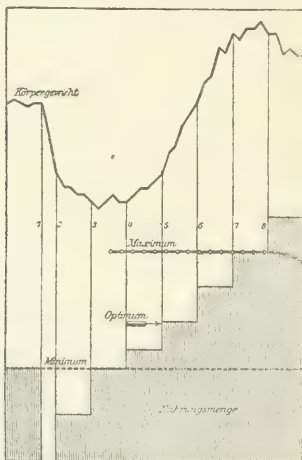


FIG. 1.—Shows the effect on the weight curve of various amounts of food. An infant two months of age is receiving breast milk through a bottle. The weight curve is seen to be stationary as a minimum or sustenance diet is being administered. At (1) the milk is completely withdrawn; we see a sudden and marked drop in the weight curve. At (2) one-half of the minimum diet is fed and the decline in weight is noticed to be not so steep. At (3) a sustenance diet is again reached which prevents a further loss. At (4) the minimum is overstepped and the weight curve ascends. At (5) the optimum is reached and we see the best gain. At (6) we see more food is administered but there is not a corresponding response in the weight curve. At (7) the maximum is reached. This amount the infant can still handle without damage. At (8) we see the organism overtaxed and the weight curve descending.

consideration. In one case it may be a congenital feebleness, a congenital diathesis (exudative, neuropathic or hydropic) then unfavorable surroundings, hospitalism, excessive heat, irrational feeding, enteral and parenteral infections. If we are to be successful in advancing the weight curve and avoid nutritional disturbances, we must employ every means at our command to secure a wide limit of tolerance and furnish the infant the optimum of food; that

is, that amount which causes the best gain with the least strain on the organism.

It is natural to suppose that if an infant is not gaining in weight either the total quantity of the food should be raised or some of the percentages increased. This is true providing the optimum point has not been reached. It is just here where in an endeavor to force the infant to gain, an excessive amount of food is administered which causes a great loss of weight. It should be definitely understood that in disease the tolerance limit is lowered. By overstepping

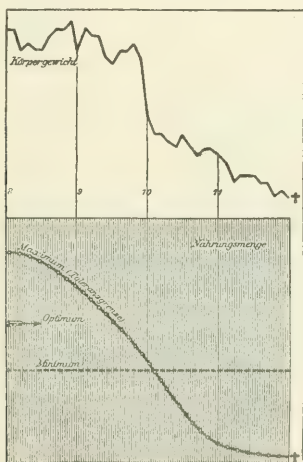


FIG. 2.—This is a continuation of Fig. 1. The excessive diet is continued uninterruptedly with a resultant steady fall of both the weight curve and tolerance limit until death results.

what is the maximum figure at that particular time there is superimposed on the first condition, a second one, that of a nutritional disturbance. This is not so liable to happen in the breast-fed baby as in the artificially fed. The bottle-fed baby gets its milk with little exertion and the thirst may cause large amounts to be craved. We all appreciate how important and beneficial gavage is in the seriously sick infant. But as a rule the intervals between tube feedings are long and instinctively we administer a diluted food.

Quite frequently in an infant seriously ill with an alimentary

intoxication or in the stage of atrophy, the correct decision whether to advance or lessen the food is the deciding point in the baby's life. The tolerance must not be overstepped and though it may for a time be under a sustenance diet, by judicious care we may hope that it be raised and that it be made possible to nourish the infant. Truly in these cases we are between the Scylla of starvation and the Charybdis of intoxication.

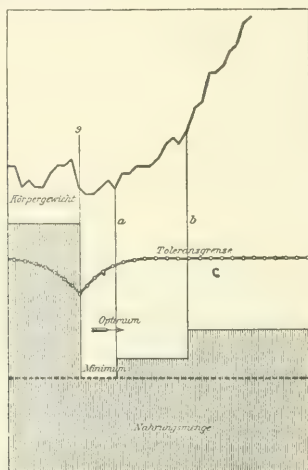


FIG. 3.—Shows the effect of early institution of treatment of the last case. At (g) the food is reduced to the minimum which brings about an increase of the tolerance. The food is gradually raised to the optimum with complete recovery of the baby.

Summer diarrhea we now explain as due to the overstepping of the tolerance limit which has been lowered owing to the excessive heat. It is not to be denied that a bacillary diarrhea exists but the usual case of summer diarrhea is not dependent on bacteria but is a metabolic disturbance. We see it originate in babies fed on a sterilized food and we see it cured not by antiseptics but by a careful adjustment of the fuel to the furnace. If we overfire our boilers only disaster can follow. So in a given case of a digestive disturbance we will not attempt to benefit the condition by the administration of drugs but we will do all in our power to raise the limit of tolerance. In one case this may mean a change of hygienic sur-

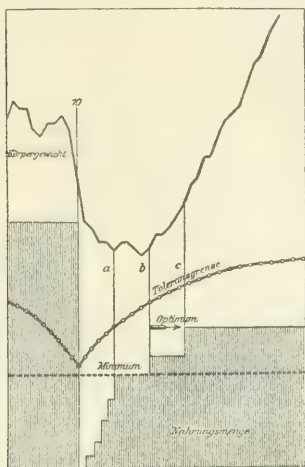


FIG. 4.—Shows the effect of treatment at a later stage. The condition has gone on until the tolerance limit has been reduced to the minimum. The food is completely withdrawn and gradually increased to the minimum and then to the optimum which brings about a rapid increase of the tolerance limit.



FIG. 5.—Shows the condition to have advanced so far that treatment is unsuccessful. At II and at c the food is completely withdrawn but it is impossible to raise the tolerance limit to the minimum and death results.



roundings or again the change to a food with a higher tolerance limit to one previously employed. We will see that the food is kept at the optimum and only advanced with the increasing ability of the infant to care for the same. Clinically we are not always able to measure the tolerance limit, but by careful observation of the weight curve, temperature and general behavior of the infant we are able approximately to determine its level.

Nothing is so effective in raising the food tolerance as breast milk. No matter how careful we are in our dosage of artificial

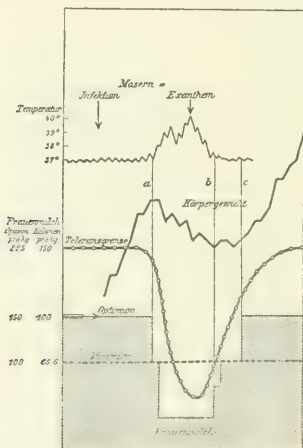


FIG. 6.—Shows the effect on the tolerance limit of an acute general disease. At *a* with the beginning of the fever instinctively less food is taken with the result that the tolerance limit which has been much reduced is not overstepped and a secondary injury to the nutrition is avoided.

food, for some of these infants it is absolutely impossible to reach a sustenance diet. No case is to be despaired of until breast milk has been resorted to. Success in the seriously ill infant even with breast milk is only attained with a correct technic. While at least an energy quotient of 66 is required on a diet of breast milk to prevent a loss of weight, it is frequently necessary for days to keep the quotient below this point. It is always desirable to reach the same as soon as possible so as not to endanger the infant from starvation;

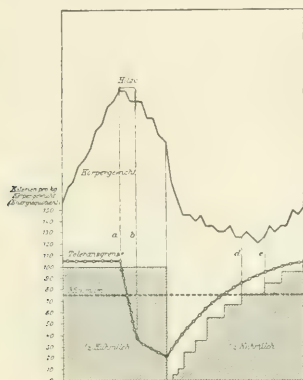


FIG. 7.—Shows the effect of heat on the tolerance in an artificially fed baby. At *a* is seen a drop in the tolerance curve owing to the heat and the continuation of the former diet. At *c* all food is withdrawn and then gradually raised which brings about an increase in the tolerance and recovery of the baby.

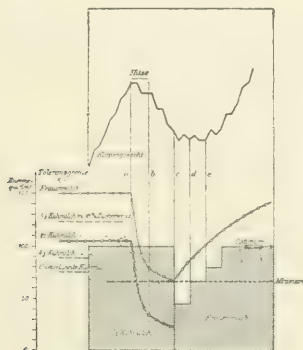


FIG. 8.—Shows the limit of tolerance for various foods in a six weeks old healthy infant. It is seen to be the highest for breast milk and lowest for whole milk. It is seen in the figure that as a result of the heat there is a great loss in weight. The condition is rapidly cured by breast milk.

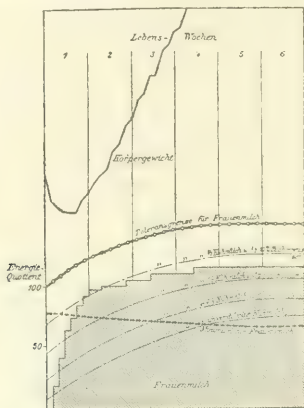


FIG. 9.—Shows the tolerance limit for different foods in the new-born. As a result of receiving breast milk there is a steady increase in the tolerance limit for the other foods. It is seen that during the second week the infant could be fed one-half milk and at four weeks whole milk.

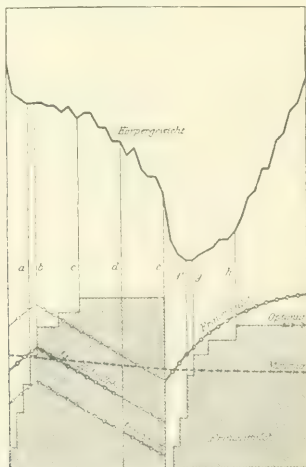


FIG. 10.—Shows a new-born baby fed on one-third cow's milk. At *b* the tolerance limit is above the minimum but soon falls and the weight also as a result of an increase in the food. The mother then resorts to one-half milk believing the milk too weak with a further damage resulting. Infant is cured by breast milk.

a too rapid increase exposes the infant to the possibilities of a relapse.

The carbohydrates have the greatest influence in advancing the weight curve; this action is dependent to a very great extent on the other elements of the food. Then again in morbid states they may be the direct cause of very great and sudden losses in weight. The fats as is well known, play an important part in raising the body weight. Frequently, however, they cause the weight to descend; they have the power of robbing the body of large amounts of mineral matter. They are true esters and on splitting combine chemically with Na, K, Ca and Mg; in nutritional disorders they pass out of the body in the stools. In disturbances of the salt balance the larger the amount of fat fed the greater will be the loss in weight. The decline in the weight curve is a gradual one much unlike that which follows in the wake of a sugar disturbance.

Infants show a great difference in their tolerance for the various carbohydrates and the fats. This at times makes the whole subject extremely perplexing and has led some physicians to deny that there was such a thing as scientific infant feeding. It is not possible to lay down definite laws in regard to which sugar and which starch and how much fat will act most favorably on the weight curve and restore the metabolic balance. It is here that a rich clinical experience in correlation with a carefully considered anamnesis will stand one in good stead. The influence of the food on the weight curve is well shown by the charts of von Pirquet published Sept. 15, 1910, in the *Zeitschrift für Kinderheilkunde*.

1467 UNION AVENUE.

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## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON PEDIATRICS.

*Meeting of December 12, 1912.*

WILLIAM SHANNON, M. D., *in the Chair.*

#### PROTEIN MILK AS A CORRECTIVE OF DIGESTIVE DISTURBANCES.

DR. HERBERT B. WILCOX and MINER C. HILL presented this paper. Dr. Wilcox said that the experience of different writers had differed largely in the methods of preparation of protein milk which had given

widely divergent fat percentages and caloric values to the mixture. The experience related in this paper had to do with a protein milk made from skim milk and having a fat content of less than 1 per cent. During the summer and winter of 1910-1911 protein milk was, under Dr. John Howland, used as the routine and continued diet for nearly all patients in the infant wards of Bellevue Hospital. The incentive for undertaking the study upon which his report was based lay in the conclusion then reached, that the value of protein milk depended upon its use as a corrective, that it was not to be considered as a fit means of prolonged nourishment and that its period of usefulness was limited to the first seven or ten days of the dietetic treatment.

In any acute digestive disturbance low fats and sugars were certainly indicated, while higher protein than they until recently believed advisable was now known to be well borne, and indeed actively beneficial. To the early stages of such digestive trouble protein milk seemed to be better adapted than any other food preparation, but as the severity of the disturbance lessened, the tolerance for and need of more fat and carbohydrate increased and the high protein while still well borne was less needed as a neutralizer of fatty and carbohydrate fermentation. Its prolonged continuance brought about a needlessly heavy drain on the nitrogen metabolism.

During the first eight months when protein milk was made use of as a substitute for other milk mixtures, about 400 infants varying in age from prematurity to twelve months were given the mixture, in most instances during their entire stay in the hospital, a period averaging one month. The results were most gratifying in that the children quickly recovered from the acute evidences of their digestive abnormality but they were usually unsuccessful in their attempts to make them gain in weight. This fact coupled with the evidences which they had that cases of gastric indigestion, colitis, noninfectious diarrheas and simple digestive incapacities responded with unexpected promptness, led them to begin the use of protein milk as an initial corrective alone.

They had deviated from the principles laid down by Finkelstein and Meyer only in the lower fat in their mixture. They felt certain that the need of low fats was of first importance in treatment.

In the application of the food they had followed a plan quite different from that of the originators or of any others with whose work they were familiar. They had found no need of preceding protein milk by tea or cereal decoctions. This preliminary took Finkelstein and Meyer three days and involved great initial loss in weight. No objection had become apparent to the use of protein milk in combination with other foods. They had combined it with benefit with plain milk mixtures, breast milk and some solid foods. They believed that the continuance of protein milk over many weeks was unnecessary and often times injurious. Finkelstein and Meyer in 123 cases obtained good results but gain in weight only with relatively large amounts of carbohydrates and by feeding very large

amounts of the food. These observers had experienced great difficulty in getting their cases changed from protein milk to other foods and advised strongly against its use with any of them.

The intent of this paper was to show that: 1. Protein milk was best given without a preliminary course of tea or cereal decoctions. 2. That it was efficacious in all acute and chronic infections of the gastrointestinal tract. 3. That it was equally suited to fermentative and putrefactive processes. 4. That it was better given in combination with other foods than alone except for a short initial period. 5. That children on it could without danger be quickly transferred to plain milk mixtures.

From May, 1911, to November, 1912, 261 children suffering from a variety of digestive disturbances were given protein milk. A large majority of them remained in the ward over three weeks or long enough to enable one to reach definite conclusions as to the results. These children varied in age from prematurity to nine years. Before instituting protein milk diet, in many instances plain milk mixtures were tried for comparison. These cases were divided into three broad clinical groups as follows: 1. Acute infections of the gastrointestinal tract evidenced by vomiting, bad stools, and fever. 2. Apparently noninfectious indigestions due to previous nutritional abuse. 3. Simple diarrheas, namely, those cases in which the infants could not be given food strong enough to increase body weight without accompanying gastric or intestinal overactivity.

In general it might be said that protein milk was better suited to children over rather than under three months of age. Of 256 children; seventy-two were three months or less, of whom forty-one or 56 per cent. did well; ninety-seven were from four to seven months, of whom 76 per cent. did well; sixty-two were from eight to twelve months, of whom 85 per cent. did well; twenty-five were over one year, of whom 72 per cent. did well.

Among these there were many suffering from very severe digestive abnormalities, and in forty-four cases an unsuccessful trial of diets other than protein milk was first made. The number of cures in the children over three months of age was 20 per cent. greater than that of the very young. The improvement resulting from the use of protein milk in acute intestinal infections, as evidenced by fever and frequent bloody, mucous stools, was more striking than in any other condition. In forty-four cases of severe intestinal infections of longer duration which they failed to correct by plain milk modifications, 70 per cent. were cured when changed to protein milk. With the initial use of protein milk in 198 intestinal cases, many of which were severe, 73 per cent. of cures were effected.

As a means of controlling vomiting protein milk had also proved of value. Among their cases there were very few having gastric symptoms unassociated with evidences of intestinal derangement. In seventy-four instances, however, vomiting was the predominating symptom; of these thirty were put at once on plain milk modifications and 80 per cent. did well. The 20 per cent. failing to respond to this treatment promptly recovered when put on protein milk.



The remaining forty-four were put on protein milk at once and good results were obtained in 82 per cent.

Children were frequently seen who tolerated only sufficient food to hold them in stationary weight and in whom every addition to the diet resulted in evidences of gastric overstrain. In such cases the addition of protein milk increased the food tolerance and this applied equally to fat, carbohydrate and proteid.

The indication for protein milk seemed equally clear whether the indigestion depended primarily on a fat or carbohydrate incapacity, a bacterial fermentation or putrefaction. Whether it was the fat or sugar that was primarily at fault, an incapacity for both usually soon obtained. The low fat and sugar of protein milk met this need. If fermentation predominated the low fats and sugars tended to retard it and the high protein, whether chemically or mechanically, seemed to be active in neutralizing this fermentation, in aiding the digestion of other food elements and in restoring the balance of the intestinal flora. If putrefaction existed protein milk furnished enough sugar to inhibit the pure proteolytic activities of the bacteria by turning the facultative organisms into fermentative activity.

Protein milk was not a general panacea nor could it be considered the only means of controlling digestive abnormalities. It had been their experience, however, that those indigestions which did not respond to such usual means would respond much more readily to this treatment than to the less rational procedures of initial starvation, rough purgation, sugar infusions, and other usual or unusual methods. Before protein milk was used every child was given on admission an initial dose of castor oil, now only the more severe cases received this vigorous initiation. There was reason to believe that diarrheas due to the gas bacillus, the bacillus disentericus and other bacteria might logically and more easily be corrected by protein milk than by purely bacterial starvation methods. Reason for such belief was found in the fact that these inhabitants of the intestinal tract were more or less facultative in their biochemical activities, and anything like a pure culture of any one group was a rare intestinal finding.

The buttermilk which they used was made from pasteurized milk containing 1.75 per cent. fat. To one quart of this was added 1 ounce of buttermilk from some reliable dairy. This was allowed to stand for twelve hours at a temperature of 70 to 80° F., being thoroughly beaten at intervals of two or three hours and then placed on ice until needed. Each day's buttermilk was made from that of the receding day, a smaller amount of stock being needed as time went on. The amount of stock used was determined by the degree of acidity desired. To make the junket two quarts of pasteurized milk and two Hansen junket tablets were used. After standing twenty minutes at a temperature of 100° F., the precipitated casein was strained through gauze, washed in water, and forced several times through a fine sieve with a potato masher. The sieving was facilitated by adding buttermilk to the curd and was continued until the curd was thoroughly broken into fine flakes. One quart

of buttermilk, 1 quart of water and 1 grain of saccharin to the quart were added to the curd and the whole thoroughly beaten to form a suspension. Protein milk thus made consisted of fat 0.8 per cent., sugar 2.4 per cent., proteid 2.8 per cent. The caloric value was 8.5 to the ounce. This mixture must not be heated too quickly nor above 90° F. or tough masses of casein are likely to form. A large hole in the nipple is also needed and the bottle should be thoroughly shaken every two or three minutes.

The corrective period divided itself into four periods: 1. That in which protein milk alone was given. 2. That in which protein milk plus malt sugar was given. 3. That in which much protein milk plus a small amount of plain milk was given. 4. That in which the protein milk was largely replaced by plain milk. The usual duration of the first stage varied from two to fourteen days. As soon as the digestive condition showed some improvement malt sugar was added. They had found the dextrimaltose preferable as it could be used in greater quantities with less danger of gastric or intestinal irritability than the other forms of malt sugar that had been used in these cases. The average duration of the second stage was six days but varied from two to twenty-three days. The aim was to make the first period in which the protein milk alone was used as short as possible. It was also found that much better results were obtained from the addition of malt and some plain milk than by providing all the calories needed with malt alone and thus raising the carbohydrate percentage higher than was safe or desirable. The time necessary for the entire correction period averaged twelve days, when the child was discharged and turned over to the dispensary direction. With the bulk of food consisting of protein milk the calories received during these corrective stages were low and pronounced gain in weight was not to be expected. Such was the apparent effect of the protein milk on the assimilation of other food added that gains were noted in many cases where they were not looked for. It was not to be expected that young children would gain in weight when taking less than 30 calories per kilo on the usual milk diets, yet many of their cases had done so.

In no case was any untoward result noticed from mixing protein milk and plain milk feedings. Protein milk was used with benefit in combination with cane, milk and malt sugar, plain milk and breast milk. In twelve cases suffering from very severe nutritional disorder, after resorting to breast milk without improvement, protein milk alternating with breast feedings was tried and in all of these cases the stabilizing effects of the protein milk was immediately apparent and the breast milk was then well assimilated.

#### THE DOUBLE FUNCTION OF FATS AND CARBOHYDRATES IN NUTRITION AND THEIR NUTRITIVE PROPERTIES.

DR. HENRY DWIGHT CHAPIN of New York read this paper. He stated that nearly all text-books and articles on nutrition classed the fats and carbohydrates as foods whose function was merely to supply

heat and energy. It was customary to express their nutritive value in calories. To determine the caloric value of a fat or carbohydrate a definite quantity of the material to be valued was burned with oxygen in a vessel surrounded by a known amount of water and from the rise in temperature of this water the number of calories the fat or carbohydrate yielded might be readily calculated. In calculating human dietaries it had become the common practice to work out the number of calories of the different components of a feeding and by adding them together to determine the nutritive value of the food, on the assumption that the nutritive value of the different food elements varied directly with the amount of heat they would yield when burned outside of the body. Body heat, however, was a by-product. If the animal organism demanded food primarily for the heat it yielded, such methods would be exceedingly useful and accurate, but food was not utilized in the manner. It had to be digested, assimilated and carried to the muscles, organs, and tissues before it could be of value to the body, or before it could be burned. It had never been shown that the animal organism used heat derived from food except to maintain body temperature, and in the summer time and in hot countries little or no food was required for this purpose; yet food was required under such conditions. An infant needed just as much milk in the tropics as elsewhere. The heat above that needed to maintain body temperature was excreted. It was evident, then, that the demands of the body for fats and carbohydrates were not primarily for the heat they would yield, and that the heat excreted was not a measure of food needed for growth. Body heat was produced by the expenditure of energy. During sleep there was a suspension of external activity and the heart, lungs, and digestive organs if they contained food, only were at work and heat production was at a minimum. When a human being was awake and sitting up, or standing, more muscles were brought into activity and heat production increased proportionately. When severe muscular exertions were made, heat production increases at a tremendous rate, being over nine times as great as during sleep. Again, heat production was not dependent on the size of the body or upon its weight, but upon the amount of activity of the body or its organs. Activity depended upon the expenditure of energy and this might be either mechanical or chemical. When food was digested the changes from one form to another called for chemical energy. The energy of the body was derived from the combination of oxygen of the air with the assimilated fat and carbohydrates and a part of the protein of the food. When energy was expended in the body it was changed into heat and then became a waste product which must be excreted. The energy content of the food could not be measured directly but as the expenditure of a definite amount of energy always liberated a definite quantity of heat, potential energy could be measured indirectly by the heat of combustion of the food.

The amount of heat produced during digestion and assimilation depended directly upon the digestibility of the food, that is, the

amount of energy to bring about its digestion. Easily digested food caused little expenditure of energy for digestion, while food that was digested with difficulty called for much energy with a consequent high heat production. Some foods might require a greater expenditure of heat in the process of digestion than they themselves contained. Zuntz in Germany, had made some experiments to determine the amount of energy for the chewing of different kinds of foods having practically the same nominal caloric values and found that it required 76 calories of heat to chew 1 pound of hay, 47 calories for green fodder equal to 1 pound of hay, 21 calories for 1 pound of oats and 6  $1/3$  calories for 1 pound of corn. Available energy might be defined as the total energy minus that which was lost in the excreta and in gases which escaped, and net energy as available energy minus the cost of digestion and of preparing food for use. Hence physiological food value and caloric value were not identical. It had often been observed that small quantities of some forms of food were more nutritious in practice than larger quantities of other forms of food which theoretically had the same nutritive value, that was, yielded the same number of calories. Hart, McCallum, Steenbock and Humphrey, who conducted experiments upon animals at the Wisconsin Agricultural Experiment Station, concluded. "There is evidence from the data that there is a distinct and important physiological value to a ration not measurable by present chemical methods or dependent upon mere supply of available energy. While the latter are important and give valuable data for a starting-point, they are nevertheless inadequate as final criteria of the nutritive value of food."

The food needed for growth was not shown by the heat produced in the body. Growth consisted of an increase in the number of cells of the body and as each new cell contained fat and carbohydrate there must be more of these substances in the food than the heat excreted showed had been burned, or growth could not take place. Therefore the heat excreted could not be used as a standard for determining the quantity of fats and carbohydrates needed in the food when growth was taking place.

Bodily activity rapidly depleted the stored up carbohydrates and when these were used up the body fat was drawn upon while there was practically no increase of excretion of protein wastes, which showed that carbohydrates and fats were primarily suppliers of energy and secondarily of heat.

In considering the function of fats and carbohydrates in nutrition it had been customary to stop at this point, but Babcock had recently shown that they had another function, which was to supply water to the cells in a manner that controlled cell nutrition and growth. The principal carbohydrates used in animal nutrition were cellulose, starch, glycogen, cane sugar, milk sugar, dextrin and maltose. Cellulose, starch, and glycogen were practically insoluble in water. The others were all soluble. All were composed of oxygen and hydrogen and carbon. The digestion of carbohydrates consisted in converting them into dextrose, the sugar

of the blood, and this was brought about by the digestive enzymes adding two parts of water to cellulose, starch, glycogen and dextrin and one part of water to cane sugar, maltose, and milk sugar. The assimilation of carbohydrates consisted of converting into glycogen, which was insoluble, the portions not needed for immediate use, and the process consisted of removing two parts of water from dextrose. The methods of producing nutrition and growth in the cells consisted essentially of hydration and dehydration.

As the hydrogen and oxygen were present in carbohydrates in the proportions that neutralized each other and formed water, the carbon was the only portion of the carbohydrate which could combine with the oxygen from the air and be available as an energy producer. Dr. Chapin showed by means of graphic formulæ that the oxygen combined with the carbon and both passed out of the cell as a gas, leaving behind the water of the carbohydrate. He also showed that when fat was completely oxidized in the cell it was changed into carbon dioxide gas and water, the water produced weighing more than the original fat. There was a difference between fats and carbohydrates in the way this water was produced. In the carbohydrates it was merely split off from the carbon, while in the case of fats it was actually produced in the cells by the oxidation of hydrogen of the fat. As producers of energy the fats and carbohydrates were interchangeable, but as water producers in the cells they had unlike properties.

Cell nutrition depended upon metabolic water, that is the water chemically produced from the food. If cells were to obtain nourishment from the blood by osmosis the cell contents must be of less concentration than the blood, or the soluble contents of the cells would flow to the blood and the cells would be starved. When dextrose or fat was oxidized in the cells the carbon was removed as a gas and the water split off from the carbon of the dextrose, or produced by oxidation of the hydrogen of fat, was left behind to dilute the cell contents. The blood was now more concentrated than the cell fluids and its nutriment flowed toward the cell. As fats, when oxidized in the cell, diluted the cell contents almost twice as much as the same quantity of carbohydrates and thus stimulated a more rapid flow of nutriment to the cells, it was not difficult to see why cod-liver oil, butter, and cream were so useful in tuberculosis as reconstructives. They were not needed for their energy because cases needing these foods were not abnormally active but were kept as quiet as possible.

In discussing the rôle of milk fat as a producer of metabolic water, Dr. Chapin said that in infancy there was little demand for energy to be used externally as infants slept almost all the time. In cow's milk containing 4 or 5 per cent. of carbohydrates, two-thirds of the caloric value lay in the fat and one-third in the carbohydrates. The fat would produce over 2 ounces of metabolic water to dilute the cell fluids and the sugar about 1 1/2 ounces of metabolic water to 50 ounces of milk.

While a chick was developing inside an egg shell it was not ex-

pending energy through bodily activity, and its body heat was maintained by the heat of the incubator; it, therefore, needed little food to meet its energy and heat demands. Yet the yolk of a hen's egg contained nearly 23 per cent. fat but no carbohydrates and the fat contained less carbon than other fats. When it was remembered that growth consisted of enlargement of and division of the cells which called for rapid assimilation of nutriment it would be seen that a substance with great capacity for producing metabolic water and thus causing a rapid flow of nutriment to the cells would be just what was needed in milk and eggs. It was supplied as fat.

Metabolic water was all that some animals required. Babcock had shown that the imbibed water of other animals was needed mostly as a vehicle to carry off surplus heat by changing it into latent heat when the amount of heat produced was too great to be removed by radiation, and for removing protein waste when in a soluble form as urea. "Metabolic water derived from the oxidation of organic nutrients would probably be sufficient for all animal needs were it not for the elimination of poisonous substances resulting from protein degeneration."

Dr. Chapin from these facts drew the following practical observations: "It is quite evident that an overemphasis has been placed upon caloric values of foods, particularly as far as the nutrition of infants and growing children are concerned. Infants need little food for their energy except as this is expended in digestion and assimilation of food. Their natural food is highly specialized in composition and in digestive properties and is peculiarly suited to them. Milks of various animals vary in composition and digestive properties directly with the variation in type of the animal. A proper estimation of foods, in a last analysis depended upon digestive suitability and capacity to produce true growth and proper development.

#### DISCUSSION.

DR. HOOBLER presented a chart covering the nitrogen metabolism of several children fed on protein milk. From figures submitted it was shown that in cases on such food the nitrogen intake was considerably higher than usually fed to children. Though the intake was higher still the absorption was excellent, 95 per cent. being absorbed, which is the same as a normal child. The retention of nitrogen gradually increased from day to day until supposedly the nitrogen need of the infant was fully met, then the retention remained at a level, being sufficient to meet the protein need for growth.

Dr. Hoobler also presented certain results bearing on feeding of large quantities of protein as gathered from experiments made under supervision of Dr. Holt and published in the *Am. Journal of the Diseases of Children*, Nov. 1912. The results obtained had a distinct bearing on the various factors which cause the stools to



change from a diarrheal type at the beginning of protein milk feeding to the smooth, pasty yellow stools which appear after four to six days feeding of protein milk.

These factors are:

1. There is a marked lowering of the total acidity of the stools.
2. There is a marked reduction in the free fatty acids present in the stool.
3. The amount of fat in the form of soluble or insoluble soaps is much increased.
4. The amount of water lost from the body through the stools is greatly reduced.
5. The retention of mineral salts is greatly increased.

All of the above factors are favorable for producing a change from frequent green watery stools to the smooth, pasty yellow stools which appear after four to six days feeding on protein milk.

DR. GRAHAM LUSK said that the nutrition of the body depended upon furnishing food for maintenance, repair and growth. All these factors appear in the infant. The baby at the breast takes food containing calories sufficient for his maintenance and about 15 per cent. in addition, which latter he adds to his body for growth. His own instinct leads him to take nourishment sufficient to accomplish this result. If he should fail to take this additional 15 per cent. of fuel value, he would receive only a maintenance ration and he would not have material for his growth. This instinct as regards taking a sufficient quantity of food, belongs to the race. In the extended experiments performed under the auspices of the Remsen Board, it was astonishing to find how the quantity of bread taken by each individual daily was practically constant, usually not varying more than 20 grams for the individual. Here, as in infancy, instinct furnishes the guide for nutrition.

If, however, the baby is not nourished in this natural fashion, it is a matter of luck whether he gets sufficient support for his organism to cause him to grow properly. The foods which are administered to him are protein, fat and carbohydrates. Protein is made up of a great many structural units called amino-acids. These amino-acids are in number as many as the letters of the alphabet and their possible arrangements as manifold as there are words in the dictionary. The protein is broken in the intestinal tract into these several amino-acids and enters the blood in the form of amino-acids. These various amino-acids serve to build up the varying portions of the machinery of the cells. Proteins characteristic of the cytoplasm, proteins characteristic of the granules and of the nuclei of cells are laid down within the several organs of the body from these amino-acids, and these protein molecules become active portions of the machinery of cell life.

Even in babyhood, there is a wear and tear upon the protein constituents of the cells as is manifested by the waste of nitrogen in the urine of the infant when protein starvation occurs. It is therefore necessary to administer in the food, protein sufficient to repair the wear and tear quota which has been destroyed, and in

addition to that to give enough to furnish new protein building-stones for the constructive growth which is inherent in the protoplasm of the young of all species. Besides protein, however, material must be furnished to supply energy for the maintenance of the movements of life. This material is given in the form of carbohydrate or of fat. In experiments which were performed in my laboratory, young pigs were brought up on skimmed cow's milk to which was added 3 per cent. of sugar; the pigs grew normally upon this diet despite the fact that ordinary sow's milk contains 11 per cent. of fat and relatively little carbohydrate. There is no question that carbohydrate may supplant fat in the nutrition of children if that be deemed necessary. Fat, on the contrary, cannot supplant carbohydrate entirely because under circumstances of an exclusive fat-protein dietary acidosis appears.

It is necessary to consider the calorific requirement of the infant when a proper dietary is to be devised. This should contain during the first three months 90 calories per kilogram of body substance. In experiments which Dr. John Howland performed in my laboratory, we have seen that an infant may eliminate 15 calories per hour hour after hour, after taking a usual milk mixture. Food itself in ordinary quantities may somewhat increase metabolism. The addition of protein so that the protein content of the milk was doubled caused an increase in the heat production of the child from 15 calories per hour to 19 calories per hour. This increase of heat production was due to the specific dynamic action of protein. I have recently shown that this is caused by the stimulation of the protoplasm through the action of certain amino-acids. For example, in one experiment, ingestion of a small quantity of glycol by a dog caused the metabolism to rise 50 per cent. I would add that when these calorimetry experiments upon children were made, the heat production of the baby was measured and the nitrogen in the urine, the carbonic acid excreted and the oxygen taken in were carefully determined. From these data it was calculated how much fat, protein and carbohydrate had been oxidized in the body during the period, and it was found that the heat produced during the hourly period was exactly equal to the heat that should have been produced had the calculated quantities of elementary foodstuffs been oxidized during the time.

It is stated that the heat value of foods is largely lost through the work expended in the digestion of the food. However, one should remember that the breaking down of protein into amino-acids, or of fat into fatty acid and glycerin in the intestine, is not accompanied by the evolution of heat. Furthermore, if agar be given, as has been shown by Benedict, there is no increase in metabolism notwithstanding a great activity on the part of the intestinal tract. Again, Benedict has shown that cathartics which strongly stimulate the intestinal tract have no effect at all upon the heat production in the organism. So the *Darmarbeit* of Zuntz as a causative factor of the increased metabolism after food ingestion must be abandoned.

In Dr. Hoobler's chart two points may be observed. In the first

place, the addition of protein to the body not only depends upon the formula representing the composition of the milk ingested, but also upon the protein content of the organism. A large quantity of protein will be absorbed by cells whose protein supply has been depleted, whereas with the same diet a much smaller quantity of protein or perhaps none at all will be deposited by an organism whose protein content has reached a condition of optimum saturation. In the second place, Dr. Hoobler has stated that in one of the children there was marked protein retention during a period of under-nutrition and this was accompanied by a gain in weight. This is not surprising since protein was added to the body for the upbuilding of cell tissue and when this takes place, there is a deposition of 0.8 calorie per gram in such added tissue, whereas when fat is withdrawn from the tissues, there is a removal of 9.3 calories per gram of fat oxidized. Dr. Hoobler's results can easily be obtained if muscle tissue be added to the body, even though tissue fat be used at the same time for the maintenance of the energy requirement of the organism.

Dr. Chapin has spoken with regard to the importance of metabolic water. I have estimated that if a man of seventy kilograms net weight should produce a hundred calories of heat per hour, and this hundred calories of heat were derived exclusively from carbohydrate, then in the oxidation of this carbohydrate, 0.24 gram of water would be produced each minute. That would mean the production of 3 milligrams of water per kilogram of body weight or three parts of water per million parts of body weight. Since the volume of blood circulates at least once per minute bearing perhaps foods brought from the intestine, it hardly seems possible that metabolic water amounting to 3 milligrams per kilogram could in any way be influential in the exchange of food between the blood and the tissues. It seems as though the osmotic pressure of the foodstuffs within the blood would be the determining factor in their passage from the blood stream to the cell.

DR. SAMUEL S. ADAMS, Washington, D. C., congratulated Dr. S. Wilcox and Hill upon the success they had obtained and particularly upon the large number of patients they had to deal with in the use of protein milk as a means of correcting digestive disturbances. Those who had a less experience could not speak upon this subject in such an authoritative way. Even the 261 cases reported by Dr. Wilcox, treated by Finkelstein's method, was not a convincing argument. The value of this report was that the work was carried on in a class of patients that all of them were familiar with in institutions where they got hold of the very worse cases. Dr. Adams said he had had a wide experience with these cases in Washington but probably one that was not as great as Dr. Wilcox had had. They had tried, at the Children's Hospital in Washington, various treatments of gastroenteric diseases and had come to the conclusion that the severe heat and intense humidity influenced the varying mortality among infants. The Finkelstein method was followed as prescribed by the author, but the results were not such as to lead them to

continue it long. There was great difficulty in inducing babies to take the food. In looking over the records of children who had badly deranged digestion he found that from 18 to 24 ounces of milk mixtures were taken but when the babies were given protein milk, four, five or eight ounces only were taken in twenty-four hours; and this had to be abandoned because the children died shortly after, giving a mortality that was very large. The cases were not selected. It seemed to Dr. Adams, however, that we were soon going to get better results in these cases although we were to-day about as far from solving the problem of infant feeding as we were years ago.

Dr. Adams asked regarding the mortality in institutions this year compared with what was had in previous years and if the results from this form of treatment were any better. He asked that they compare the treatment that had been employed in typhoid fever; ten or twelve years ago the child was placed in the bath with the water at a certain degree of temperature and excellent results were had, he had not ordered a bath for a patient with typhoid fever in five or six years and the results have been better. Atmospheric and seasonal conditions helped them in all of these cases. Only last summer the people in Washington lived more comfortably because there was less humidity and less heat. During June it was not unusual to have the thermometer register above 85° F. day and night for days and with no relief in night. Last summer it was comparatively cool and the results at the Children's Hospital showed a mortality that was less than during the preceding year.

Dr. Adams was specially impressed with what had been stated in regard to the therapeutic measures employed.

In regard to Dr. Chapin's paper he said he was very much interested in it, as he was in looking over the tables presented by Dr. Hoobler.

DR. JOHN LOVETT MORSE said that he had been very much interested and entertained and he hardly knew what to say regarding Dr. Wilcox's paper. He believed, however, that he was an honest man and that he must accept his figures. He did not see such results in Boston with using such a form of treatment. He could not quite understand why the same food should affect one sort of bacteria in one way and another sort in another way, *i.e.*, why it should antagonize fermentation in one case and putrefaction in another. In those cases of dysentery caused by the gas bacillus or allied organisms it should do good, but ought to be harmful in those caused by the dysentery bacilli; which produce toxic substances from proteids.

Dr. Morse said he was very much interested in Dr. Chapin's paper and he was indebted to him for the points he had given regarding the use of calories. He was especially indebted to him for another argument in favor of fat in the infant's food.

DR. FRITZ TALBOT of Boston, Mass., had been very much interested in the papers but wondered why the same treatment was applicable for the cure of the cases of fermentation and cases of putrefaction, the one being caused by carbohydrates, the other by proteids. Theoretically they felt if they wished to stop the fer-

mentation, they should give a food in which the special bacteria would not develop. He found it quite difficult to determine clinically just what putrefaction was. However, anyone acquainted with the work of Hoobler, the time and labor consumed in that work, must appreciate what he had to present and had presented.

He was much interested in Dr. Chapin's paper and what had been reported regarding the muscular work done; last year he had the opportunity of observing some of the work done by Dr. Benedict with regard to the amount of carbon dioxide that was excreted which was dependent upon muscular activity. The point was to learn the relationship between the pulse rate and the muscular activity. Nothing could be found in the literature regarding this.

DR. LINNAEUS EDFORD LA FÉTRA said that he had used protein milk for three seasons, having begun it at the Babies' Hospital in 1910, and as the result of his experience in severe dysentery with mucus and blood in the stools, whether the result of fermentative changes or not, the protein milk was the best means of dietetic treatment he knew of; and one was often struck with the rapid improvement that followed its use. Especially with infants having high fever, in nine out of ten cases, the improvement would be very striking after the administration for three days of protein milk containing a low fat percentage. He had frequently been astonished at the good results obtained from the use of this milk and apparently without regard to the type of bacterial infection. The living Bulgarian lactic acid bacilli must have part of the credit for the improvement in the true dysenteric and putrefactive cases. Moreover, protein milk increases the tolerance to other foods. This was a point that should, in his opinion, be emphasized. At Bellevue Hospital, in several instances where even breast milk could not be taken without diarrhea, substituting low fat protein milk for two or three nursings daily arrested the diarrhea and the breast feeding could later be resumed. The protein milk might be given with advantage in combination with other foods. Dr. La Fétra agreed with Dr. Wilcox's conclusions, and especially that in the preparation of the protein milk for therapeutic purposes it should be made from the skimmed milk.

With regard to the caloric values of various foods, Dr. Chapin had done great service in calling attention to the fact that the calories in a food may be not at all a measure of its nutritive value to the infant.

DR. GODFREY R. PISEK said that the question of Finkelstein's feeding should be, in his opinion, well thrashed out, and he believed it should be regarded only as a therapeutic measure. Using it for three or four days one then could return to the breast or other feeding and get good results in a large number of cases. He believed that Dr. Wilcox was quite within the bounds in all of his statements; what he said compared well with the experience of those who had used protein milk for a number of years.

A very important step was switching to skimmed milk after the bowel condition had improved.

Referring to Dr. Chapin's paper in regard to metabolic water: If we could not put this to practical application at once it did not lessen its value in infant feeding for a use for this knowledge may be found that would change our present ideas. We could compare this action in the cells to that of a float feed in the carburetor allowing the tissues to take up or repulse this metabolic water according to their needs.

DR. ROWLAND G. FREEMAN said that like all receipts for infant foods, Finkelstein's milk had a limited application. Its advantage lay in the fact that it contained lactic-acid bacilli in a form more palatable than buttermilk. Its disadvantages were that it contained too much fat for many cases of diarrhea, less sugar than most children could digest, while of the proteid it discarded the lactalbumin of the whey which was the most easily digested proteid, especially for children under three months for whom this food had been recommended. Modifications of the original receipt by using skim milk or adding sugar would eliminate some of the objections. It was particularly valuable in cases of offensive stools, but often better results were obtained by feeding lactic-acid bacilli in another form and then using a modification particularly adapted to the case. In regard to Dr. Chapin's paper he believed that the estimate of caloric values was most important especially as a guide against underfeeding.

DR. CHARLES GILMORE KERLEY regretted that he had not been able to hear the paper of Dr. Wilcox and but a portion of the paper of Dr. Chapin. He had found protein milk a useful addition to the diet of children with diarrhea. It could be digested before skimmed milk could be tolerated and was of much use as a means of supplying substantial nourishment when it was needed very badly. Dr. Kerley felt that sugar and milk fat was accountable for not a few of the disorders of older children, a condition brought about by the defective oxidation of the carbohydrates and fats. The disorders had a peculiar tendency to be cyclic in character and were represented in cyclic vomiting, recurrent bronchitis, eczema and periodic so-called bilious attacks.

DR. WILCOX closing.—Dr. Adam's difficulty in getting children to take this food may have been due, as it was at first with us, to the usual paucity of nurses to oversee the feeding of the bottles. This milk must be fed by a nurse or maid. The child cannot be left to take the bottle alone. The nipple will surely plug up and the baby becomes exhausted or discouraged before he has finished his meal.

As to our death rate, last year's mortality in the infant ward was 34 per cent. that of the preceding year 46 per cent. This decrease cannot be said however to be due to protein milk alone. Our death rate in this ward varies in great measure with the number of premature children admitted and with climatic conditions.

Dr. Morse's remarks this evening are practically the same as those made by him on the same subject here one year ago. We did no bacteriological work on these patients. The criticism that our



classifications and results are not thus supported is perfectly fair and we quite expected that this objection would be raised.

However this report deals with the use of protein milk as an aid in the treatment of indigestions and is not a study of the intestinal bacteria. I do not think that a bacteriological examination is necessary for the correct differentiation of digestive abnormalities. The determination of the presence of fermentation or putrefaction should certainly be possible from the ordinary examination of the stools.

Our cases were by no means all treated alike. They all get protein milk, *but*, and here lies the whole point, they get it as an adjuvant to a diet otherwise carefully modified to meet the particular needs of the case in hand.

DR. HENRY DWIGHT CHAPIN, closing the discussion, referring to what had been stated in regard to the caloric values and the system of feeding infants which was in vogue, believed that it should be correlated with scientific teaching at large and a study should be made biologically of the natural processes that occurred in the whole range of animal life.

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*Meeting of January 9, 1913.*

HENRY DWIGHT CHAPIN, M. D., *in the Chair.*

REMARKS CONCERNING THE NEED OF PSYCHOLOGIC CLINICS IN  
CONNECTION WITH THE PUBLIC SCHOOLS.

DR. L. PIERCE CLARK said that for years there had been a growing discontent in the minds of the thinking public with the slow advance in individual teaching in our public schools and one of the comparatively new departures to meet this lack had been the recent establishment of ungraded classes for the so-called subnormal children. The work in the ungraded classes had been an astonishingly rapid development. In New York City alone to-day there were 152 ungraded classes caring for over 2,700 pupils of this subnormal type, and it was now estimated that about 7,000 children in Greater New York were in urgent need of these special classes, which for this city alone would require not less than 427 special classes. Did this indicate that feeble-mindedness was on the increase in the public schools? No; it meant that they were awakening to the importance of detecting the defects in pupil material of the common schools. There could be no doubt that this defective material of the schools was everywhere; every public school had them; they need but search and they would find them. The general usefulness and importance of the work that had already been done in these ungraded classes could not be questioned. The withdrawal of the mentally unfit or deficient child from the normal

class was alike beneficial for both the normal and the subnormal. While all these pupils were undoubtedly receiving advantages from these special classes, all were convinced that the idiotic and imbeciles in this heterogeneous group of subnormal school children needed special institutional training schools and colony homes where proper habits of living and work for the whole day of life might be taught. This hopeless and slightly educable class must be cleared from the schools. In the meantime, while the State was preparing to meet its burden and duty in this respect there could be no doubt that defective children should stay in these ungraded classes, gaining as much as possible of the special education which had been patterned after the institutional plan of instruction. More exact psychiatric analyses of these high-grade defectives in the special classes should be made. Dr. Clark referred to the neurotic or nervous child. The child who had day dreams, was too emotional, had night terrors, or suffered from memory or attention defects, was motorially uncontrolled as shown in tics and habit spasms, or even had more pronounced nervous or mental disease; one who had psychic episodes of excitements or depression even leading to mild hysterias, phobias, anxiety states or psycholeptic crises and even psychic epilepsy itself. In short, this group-class was the embryo storehouse of the psychoneuroses and the near invalidism of later life. They, as physicians of special neurologic and psychiatric training, should not be slow in recognizing that this was a special field for study in causation and prevention of the functional nervous diseases. That they should all look upon this special field as the most important to be opened up was his special plea. Still more fundamental would be the study of the makeup of the neurotic constitution which all were agreed was the essential core of the neuroses. It might be just possible when this nucleus was fully disclosed that they should find it acted as a Mendelian unit and was just as transmissible as physical defects were now known to be. Out of this neuropathic constitution in its broadest conception flowed antisocial traits of abnormal child life, such as lying, stealing, truancy, sex perversion, and a host of others. Lest it might be thought that the nervous child was a negligible factor in the schools, he said that it had been estimated that this class formed 5 to 10 per cent. of all school children. They knew that a great many of these children grew up into healthy men and women in later life. If it had taken years of painstaking study to evolve a comprehensive understanding and training-treatment of the frankly defective child, how much more labor there remained for them to perform before they would understand these deviate children of the neurotic type. The whole problem of establishing psychobiologic clinics was not a new one. Most large cities had them but they were not a part, an integral part, of the school system. The formation of these psychologic laboratories was a step in the right direction, but the psychologic clinics needed expert psychiatrists and neurologists to extend and make definite a form of psychoanalytic inquiry commensurate with the newer methods in psy-

chiatry. As in the pronounced insanities, the crying need to-day was not in a lot of cases loosely studied, but a few very carefully and exactly analyzed. The reasons for establishing such clinics in the schools were that the latter had the full confidence of the parents of these neurotic children and the schools were a "going-concern" and could readily incorporate a complete and properly equipped clinic with their other special schools for the blind, deaf and dumb, and crippled. Such a clinic should have (1) a definite record of the child's defect and behavior in a false adaptation or lack of progress in the normal school; (2) a careful research of the family life and environment which might be a contributing cause for the nervousness; (3) an intelligence, judgment, will and ethical test by trained experts as well as a thorough physical examination. Then, and not till then, should a prescription of the special school treatment be given. Provision for a follow-up record should be made and a re-examination and review of the case should take place after a certain observation treatment had been applied. A system like this called for teamwork on the part of the trained teacher, psychologist, neurologist, psychiatrist, and sociologist. There was work and honor in such a field of endeavor. It portended much for the future. In closing Dr. Clark said that they were organizing such a clinic for the New York City schools and they trusted to show some important results in solving the problem, the details of which organization he trusted to present in a future communication.

#### ETIOLOGICAL FACTORS IN ATYPICAL CHILDREN.

DR. S. P. GOODHART presented this paper. He defined the term atypical, used in its most significant and broadest sense, as referring to that class of beings who, by reason of instable or rather disproportionate mental faculties did not conform to the ordinary accepted standard. This class must be differentiated from those mentally defective, as the dullard, the imbecile, or the idiot. The atypical child might often be endowed with qualities of genius or of special attitude in certain directions and it was worth the effort to awaken the heritage that lay dormant. In these children one found that heredity played an unquestionable etiological rôle. There was usually a history, either in the direct or the collateral line, of syphilis, alcoholism, psychosis, epilepsy, consanguinous marriage of parents, etc. These children were usually deficient in certain practical, or what might be called elementary intellectual qualities. There was in some a lack of emotional stability, a want of proper self-control. They were rarely well poised. These children if improperly educated and brought up in unsuitable surroundings often developed the criminal traits that cost them and society the price that ignorance and neglect had often imposed upon us. In adult life these individuals often found themselves out of tune with their surroundings, lost the incentive of life work and their mental attitude was in conflict with the conditions of life imposed upon them. Eventually

there was forced out another and weaker personality. In the soil of such conditions lay the seed of dementia precox. The influence of the experiences of the early years upon the development of the various forms of neuroses later had been emphasized during the last decade by the methods of psychoanalysis. Investigations have shown that the experiences of child life which form the nucleus for functional neuroses later in life need not be of a sexual order, but that any form of psychic trauma, attended by strong emotional reaction and suppressed, may, years after, suddenly emerge as the basis for severe psychic disturbances. In the atypical or exceptional child one might see an analogy in that borderland of psychic instability wavering between the normal and the abnormal and represented in adult life as the various obsessions, folie de doute, psychasthenia, etc. This emotion of sexual color was liable to associate itself in the case of male children with the mother, and in females with the father. Sublimation, that is the transforming of the energy of sexual impulses into productive activity should begin early in the child's life. The necessity of carefully observing evidences of the tendency to sexual inversion in children should be appreciated. Dr. Goodhart said that personally he believed that there were bisexual elements in all and that the development of the invert was probably frequently due to some one profound or perhaps repeated sexual experiences among children of the same sex. The development of the will should be especially directed to overcoming obstacles of life experience. The need of this was made evident by their knowledge of what was psychologically known as regression, meaning the turning back of the energy of the individual to the primitive, the juvenile habits of thought and action. The neurosis often appeared in the later life of the neurotic, when, confronted by what appeared as an insurmountable obstacle in his career, effort was abandoned and the psychic energy became anchored to its juvenile phantasies. In the case of the unstable mind it required intense mental strain and much attention to develop the power of energetic voluntary attention and continuity of thought. The tendency of the imaginative child to become self-centered and thus have his perceptions aroused by autoerogenous stimuli should be combatted. In allowed automatic repetition, complexes formed, the sexual perversities adhered to the subconscious, and in time of regression in later life, became active phantasies around which the neurosis developed.

The unstable neurotic type must be distinguished from the self-controlled child, the one who had himself well in hand, who had a specially vivid imagination with a mild tendency to day-dreaming, a fondness for solitude and reflection, was extremely sensitive and apparently timid. This child was liable, under unsuitable environment, to develop into the truly neurotic.

The routine pedagogical schemes were entirely unsuited to the education of the atypical child. In practical school work he was frequently found to be deficient, but usually showed some special aptitude. An effort to educate these children according to the usual school system often placed them in the category of the seriously

deficient, rapidly depleting their energy in fruitless effort and finally ending in serious mental conflict. The basic radical of true juvenile psychosis was internal mental strife, an inadequacy on the reasoning faculties and judgment; that of the psychasthenic and hysterical, extreme emotionalism; of the neurasthenic, rapid fatigue. As revealed by psychoanalysis, the morbid fears of later life not infrequently found their inception in the sad experiences associated with a high degree of emotion. For instance, horror of death might often be traced to impressions in childhood of the funeral ceremony, house of mourning, etc.

Adequate psychological pedagogy, adapted to the individual, could be applied as were orthopedics and gymnastics to the physical inefficiencies. Psychological clinics were needed with social workers whose functions would be both scientific and practical. Trained psychopedagogues would often detect the mind of a predement or preparanoic.

The years of adolescence were fraught with great danger to the psychic life. Imagination and introspection became heightened in the neurotic child, and, as in the psychology of precox, the horizon of mental activity became more circumscribed. The child might delight in the illusory life, made up of complexes, that by repetition took form and root, later, perhaps, to become the nucleus of true paranoid entities.

The exaggerations and perversions of the normal psychological perceptive and apperceptive processes, or the persistence of those which should be modified or assimilated by experience and development of the intellect, brought one close to the question of how far psychological pedagogy could save the child. Mannerisms, a tendency to neologism, certain slight but suggestive peculiarities of gait or posture, the manner of response, slight so-called habit spasm, if present at once aroused suspicion and directed attention to the neurotic element.

There was a class of children of psychopathic constitution, and, as a rule, having hereditary taint, who were intellectually up to the average but who had an intense emotionalism. They suffered from seizures of an epileptoid nature, but the earmarks of true epilepsy were wanting. The attacks might occur in the first decade, perhaps only once, or they might be recurrent for years, without any psychic deterioration. Unless the proper adjustment was made in their environment and education, their later life showed the deflections of the psychasthenic. Many of the symptoms of dementia precox were really perversions or exaggeration of normal mental juvenile life.

Personally, Dr. Goodhart said, he found the Binet tests of general value only; they were doubtless useful in schools and institutions. However, he found other methods necessary. The Binet tests did not allow one to reach the child's true emotional sphere or to reach conclusions as to the relation between judgment, memory and emotion. While it was true that the moral development of the child was largely a matter of education, there were children who were really moral imbeciles.



It was surprising how frequently they met with true paranoid psychological elements in neurotic children. There was eccentricity and peculiar deviation from the standard of conduct which were fundamentally characteristic of the developing delusions. Even here, early training, the cultivation of self-restraint, might develop inhibitory power which would enable the patient to govern impulses which held sway over morbid ideation. From this material the more intelligent criminal class, the harmless cranks and the homicidal often took origin.

In spite of the fact that heredity, both in physical and mental disease, was a powerful factor man probably did not enter the world with an unalterable fate of mental deterioration. Through the application of Mendel's law some of the irregularities of transmission in heredity were coming to be understood and psychoanalysis gave one a method for the study of subconscious activity, a phase of mental operation that exerted a tremendous influence upon the conscious activity of the individual. It would seem that many of the obscure problems of inheritance were to be accounted for through the operation of subconscious mind. The subjective mind in animals seemed to be identical with the subconscious mind in man. In man superimposed upon the intuition, induction, and emotions of the subconscious, was reason.

Dr. Goodhart said he wished to emphasize the great importance of deep emotional complexes that had been relegated to the subconscious in early life. Those who had carefully studied ancestral and personal histories of a very large number of defectives found syphilis a very prominent factor in the etiology and doubtless this was true for the neuroses.

As to consanguinity, it seemed that the character of the stock was the important factor. Consanguinous marriages between those of good stock resulted as a rule, in high-class offspring, but when neurosis was introduced, the progeny suffered far more than in different mating. There was in this a logical suggestion of high prophylactic value.

Etiologically the social and economic problems, in every aspect, bore directly upon the production of mental deviation and its development even in healthy soil.

Dr. Goodhart said he did not agree with the eminent New York jurist, Judge Foster, who claimed that sterilization of the criminal, was the cure for crime. One had to go far back of those already afflicted. Individual conscience must awaken, and public sentiment crystallize, so that the general laws of mental hygiene would be enacted and carried out under the supervision of competent scientists. Then only might they hope to be relieved of the fruitless burden of caring for mental and physical anomalies.

#### THE MENTAL DEFECTIVE AND SOCIETY.

DR. WILLIAM LELAND STOWELL read this paper. He stated that for the purposes of this paper the mental defective would be understood to be a feeble-minded person. The physician first saw the



defective at the age of one or two years, when the family began to realize that the child was not normal. It failed to grasp objects at six months of age, failed to show surprise or fear, failed to begin walking at the age of one year, to show curiosity, or sociability at a year and a half, or to talk at twenty months, and continued infantile habits beyond two years. At the age of six or seven the school teacher noted the limitations of such a child. He could not learn the use of objects, could not appreciate form and color, could not tell time, or age, or count as normal children did. If his intelligence never got beyond that of a child of two years he was an idiot; if only to that of a child of seven years, he was an imbecile; if he stopped at the level of twelve years he was feeble-minded of high grade; if almost up to the standard, he was a moron. The feeble-minded child could not compete with normal children because he lacked reasoning power, did not appreciate right and wrong or the consequences, and was actuated by impulse and suggestion rather than by design. He lacked imagination, power of initiative or prolonged application. Such persons had little moral sense and sexually were corrupt. They lacked judgment and yet might develop some faculty to a specialty.

Data had been gathered that enabled one to make a conservative estimate of one feeble-minded person to every three hundred normal ones. That meant more than 300,000 feeble-minded persons in the United States, or enough for a good-sized city like Washington or Minneapolis.

Thirty thousand of these persons were in New York State and less than four thousand of them in four proper institutions. Only twenty-three of the forty-eight states had suitable institutions for the feeble-minded at present. The author's experience had been gained at Randall's Island where there were now 1,186 inmates. All of us were inmates at birth and our present standing depended upon both heredity and environment. They tried at the Island to supply a proper environment. The girls were taught sewing and household employments and the boys worked on the grounds and were taught various trades. All of this work as well as the schoolroom work was done under the supervision of normal minds. They could not supply gray cells where none existed hence the condition was incurable and such children should remain with their peers in an institution. There he would be taught personal cleanliness and put through a modified kindergarten course.

The education of the border-line cases had been greatly advanced during the last decade. The New York Board of Education maintained special classes for the defectives and now had approximately 150 ungraded classes with a total of from 2,200 to 2,700 pupils. The practical outcome of this fine work was criticised because it seemed as though the time and space could be used more wisely. For instance, an expert could tell by a brief examination that a child was subnormal and should be in an institution all the time instead of in a public school for a short time. This was not work for the public schools for scarcely one-tenth of the children ever rose to the normal

grades. All feeble-minded individuals should be segregated in public or private institutions, many because they required physical care and others that they might have the instruction of experts. The adults should be segregated because of the likelihood of their becoming parents of their kind. Again, they were happiest with their kind as they could not compete with normal individuals in handicrafts or in business. Segregation was especially necessary for feeble-minded girls because of their lack of moral force. Most of these women became mothers and that very early in life. In 300 families containing mental defectives there were 2,013 children born, 434 of which were defective, and 160 criminal or pauper. This was six children per family instead of three, the average in America now. The author gave further statistics showing that feeble-minded women were likely to be very prolific. Lombroso contended that prostitutes were the equivalents of criminals. The experience of the Salvation Army and the House of Mercy showed that one-third of the girls were feeble-minded. Dr. Katherine Davis of the State Reformatory at Bedford, in a study of 2,000 prostitutes, decided that 29.2 per cent. were subnormal. In other words these statistics showed that feeble-mindedness was 200 times as frequent among prostitutes as among normal women. After referring to the famous Jukes family and the Tribe of Ishmealites in Indiana, the author emphasized the fact that proper prophylaxis would prevent such histories being possible. The government calmly took the lives of 100 criminals every year and yet was slow to prevent such lives from beginning.

In this state they happily had one institution where 800 women were safe from motherhood.

As already stated feeble-mindedness was an incurable condition, not a disease. The condition of the higher grades could be improved by training so that they became useful in an institution, though not capable alone. Dr. Caldecot of Earleswood investigated 341 patients who were discharged during fifteen years and found that 3.25 per cent. were earning wages, 3.81 were very useful at home, 7.5 per cent. were useful at home, and the remainder 85.5 per cent. were no good and should have been taken care of for life. These were all discharged cases supposedly good enough to be out. According to Dr. Wiley the normal average death rate was forty-four years. Of 500 cases studied at Randall's Island, the average age at death was thirteen years. Hence normal persons lived about three and one-half times as long as aments. The mortality tables showed that the deaths from pneumonia and inanition were very high, and those from diseases of the vascular system very low as compared with the normal.

In regard to the finance of the defective, they had in New York State five institutions for the care of the feeble-minded and accommodated about 4,000. The institutional cost of maintenance was about \$200 per capita per annum. The cost of caring for a defective at home would be as much, so one might say that the cost of caring for the 300,000 feeble-minded in the United States was

\$60,000,000 a year. In the Elmira Reformatory, 37 per cent. of the criminals were found to be feeble-minded, more than one in three. Greater New York's crime bill in 1906 was \$35,000,000, and that of the nation \$1,075,000,000. If one-third of these costs were charged to the mental defects of the criminals, or to criminal neglect on the part of the public, the cost of feeble-mindedness was certainly very high.

Dr. Stowell was of the opinion that if the State could not segregate the feeble-minded it should sterilize them. It should certainly be the law that no person in an institution at public charge who had been properly adjudged defective should be discharged therefrom without first being rendered unproductive. Children were not allowed to marry; why allow mental immunes to marry? They were only children in experience and intellect. Dr. Barr regarded asexualization just as quarantine, a simple protection against ill. Earl Russell in England said: "If the ruling classes in Parliament and in the law were composed of people of adequate medical knowledge, some such remedy as this would be the law of the land." Such were the views of many students of the subject and such were the author's views.

#### DISCUSSION.

DR. CHARLES L. DANA said that because of the large number of feeble-minded among their population, the question before them was of the most important of the social problems that confronted them to-day. The feeble-minded children were a menace to society: First, because they were an expense to the state when their families failed to support them; second, because of the danger of propagating a degenerate type of the human race; and third, they were the stock from which a considerable portion of criminals came. Therefore Dr. Dana believed that this problem should be most carefully studied. Much had been said regarding the segregation of this class, but after all, the important thing was this: The care of the feeble-minded must be placed under state regulation and the State of New York should authorize a State Board of Control, a board similar to the State Board of Lunacy. The feeble-minded children should be cared for under the supervision of such a Board of Control in the same way that the mentally diseased were cared for by the State Board of Lunacy. This State Board of Control should have a census made of the feeble-minded and should establish a Bureau of Records. The life history of these children should be taken from the beginning of their lives until their deaths. Before the school age many of these children should be kept under the care of their parents; when they reached the school age, it was best to educate them so far as was possible under the supervision of Boards of Education and various school departments in different parts of the state, all the time, however, although under the care of the Board of Education, they should be

registered by the State Board of Control. When any cases were proven to be unfit for school work, then they should be referred to institutions. After they had passed the school age they then began to become especially dangerous to society in that they tended to develop criminal traits. These children could then be better cared for by a State Board of Control in proper institutions when necessary. During the time of their growth some might be educated to be wage earners and become useful citizens. During the time we are developing this plan we must do the best we can with the agencies now existing. He believed the Department of Charities might do the work now but he thought that the ideal thing was to aim at the establishment of a special Board which should have supervision over these children from the beginning of life to the end.

DR. CHARLES H. ANDREWS of Buffalo said that they all believed in the segregation of the mental defectives but he asked of what use was it for under the law as interpreted by the Attorney General. So soon as a child was able to do anything useful, to do certain kinds of work, they can be taken out of these institutions upon the request of the parents or guardians, and what was the result? A boy who was a fire-bug after being released might destroy many buildings; a feeble-minded girl would become the prey of those who were looking for this class of girl. He saw an instance in a certain state institution that he visited. A young girl of seventeen years, very bright looking, a good seamstress, was wanted by her parents home for a visit. She went home and remained two or three weeks. Some time after her return to the institution it was learned that she had become pregnant and by her own brother. This was but one of a great many instances that could be cited. Further, what was the use of increasing the number of these institutions for the feeble-minded and criminals if the number of feeble-minded and criminals to occupy them grow faster than the accommodations? In addition to the states mentioned by Dr. Stowell, the law in Washington had been declared constitutional calling for the sterilization of habitual criminals, and the State Board of Insanity of Utah had recommended the sterilization of persons unfit to have offspring and the sterilization of persons insane from hereditary causes. Just when actual operative work will be done in the state of New York he did not know. The records and family history will be carefully examined and history of the physical and mental conditions noted and then, if the court approves, sterilization will be employed in accordance with the law. Just how soon this would be done, and just how much would be done, remains to be determined and they were always willing to receive suggestions along these lines.

DR. B. SACHS did not believe that any great advances had been made toward the utopian state by a sexualizing method in freeing communities from criminals and others who were menaces to society. It was well to adhere to the tangible phases of his discussion, and he said he would like to say a word with reference to the higher defectives, or those who were only slightly defective. We always have a number of these slightly defective children to deal with and

anyone who was not familiar with the facts would be surprised to see or to ascertain what a large number of them existed in our mixed population. Those children were not the proper subjects for care on the part of the state. They were the unfortunate victims of unsanitary and unhealthy environment. After more than thirty years of study of these cases he confessed that he was not ready to give any conclusions as to whether these slightly defective minds of the children were developed largely as the result of heredity or resulted chiefly from unhealthy environment. Much could be done by the family, by relatives, and by teachers in efforts at improving the mental condition of these slightly defective children. The environment of the family was a great factor in this question and the mothers were the last to admit this. Dr. Sachs was convinced that the existence of an unhealthy atmosphere in the home, the restlessness seen in these homes, the restlessness and discontent of the mother, the general preoccupation of the father, had contributed much more to the development of the defective child than assumed factors of hereditary origin. Dr. Sachs some years ago took occasion when speaking in behalf of the educational system to refer to the schools as a safe regulator of American communities; there had been a great hue and cry at various times against the schools and he said that he would like to go on record as stating that he believed there was no one power or one force in any American community that tended so closely toward the prevention of defective and nervous children as did the healthy restraining influence of the average school; he thought the school was the safeguard in the entire social makeup. Fortunately for the defective children the schools were excellent places for discipline during their early years of life and this was one force that appealed to him in the improvement of the condition. The section on Pediatrics could exert an excellent influence in the way of pointing out to the Board of Education the absolute necessity of giving these children instruction and the necessity of having these slightly defective children properly cared for. The development of the normal child was interfered with when such a child was expected to pursue his studies in the same class with the abnormal child, and it was a still greater injustice to the abnormal child to be placed in the same class with the normal child. All the defective children were in one class in this city; this was simply because the question had not yet been sufficiently studied; to place all defective children in one ungraded class was a very sad error. Defective children differed much from one another in mental capacity and if anything was to be accomplished in the way of improving the condition of the defective children, it would only be done by establishing special schools for them or a series of ungraded classes. They should insist upon, or advocate, some educational system; the city of New York should provide for the proper training of this large number of higher defectives. A partially defective child under proper training might become a useful member in the community in which he lived; there was much good material among them and by proper educational methods



much could be done for them. The Board of Education of the city of New York should be urged to live up to their duty of training these higher defectives at least. The complete imbeciles and the seriously defective children should be entrusted to the care of the state.

DR. MAX G. SCHLAPP said that Dr. Sachs was probably referring to the feeble-minded children and the statement that a large percentage of such children could be educated and become useful members of society was not borne out by the facts. He had occasion to look over the reports that were issued by an institution where this work was carried on and it was learned that in Birmingham a very small per cent. of the feeble-minded were ever capable of doing any good work or becoming self-supporting. This was, however, a small factor in the question. He believed that the same training that the child got in the schools could be had in institutions. The most serious factor to be considered was the welfare of the members of a community. These children were without exception potential criminals. They would be led into all sorts of things and especially into conditions which were criminal. Most all of them were sexual imbeciles and they would do things before the teacher that could not be described before such an audience. These children were to be found in the children's courts as well as in the clinics. Time and again they would mislead the normal child. Girls of young age would become pregnant, and boys would do things that were not normal, spread disease, etc. Dr. Schlapp thought that this was the most important part of the question, the development of these criminals in the community. The criminals were drawn particularly from this class of individuals. In 1902 a report of an institution in Prussia (?) stated that 5 per cent. of their beautiful institutions were devoted to the care of the mental defectives. In 1905—three years later—an examination of these children was made by a psychiatrist and he found that a little less than 50 per cent. of the inmates were mentally defective. Dr. Stowell stated that this was a condition and not a disease and Dr. Schlapp asked Dr. Stowell if he considered syringomyelia a disease. Whether Basedow's, myxedema, Addison's, and similar conditions were to be catalogued as diseases? Were they not due to some disturbances of internal secretions? Was not syringomyelia due to some proliferation of the glia tissues? These were the conditions that were found to be the cause of feeble-mindedness. If they considered such as a disease, then, feeble-mindedness was a disease.

Dr. Schlapp thought this question was a very important one, a very serious one, but the most important part of the question was to determine if they could find a cause for the feeble-minded condition. He thought it was the duty of the state to take these individuals out of the community and place them in institutions where scientific work was carried on and where it might be possible to determine, if it was at all possible, the nature of the condition and to get some prophylactic which would prevent the spreading or increase of the condition. He believed they were just about to



enter upon a field, to open up a vista which would perhaps surprise them all, and that particular field pertained to the internal secretions. Idiopathic feeble-mindedness was due to some disturbances of the internal secretions although he would not say positively that he thought this to be the most important factor in the creation of feeble-mindedness. He believed that the internal secretions were the most important factor in idiopathic cases.

MR. ANGUS P. THORNE of the Department of Charities said that the most important thing was for the state to adopt some definite policy for the care of the feeble-minded and he believed that the state of New York was practically committed to a definite policy of segregation. At the present time the State Board of Charities had supervision over all institutions devoted to the care of the feeble-minded.

Mr. Thorne did not agree with Dr. Dana; he did not believe that a State Board of Control was necessary. The State Board of Charities had the power given them to do the work that was suggested for the State Board of Control. If the state would provide the means for caring for the feeble-minded, the state Board of Charities could handle the work. The most important thing, however, in the study of this work should be a scientific investigation which should be undertaken to ascertain the underlying causes of the feeble-mindedness, not investigations covering a period of one or two months, but a period of years. The Department of Charities has established a "Clearing House" for the examination of these defectives and, through the generosity of several private citizens, appointed a staff of physicians at Randall's Island who will study them after admission. The State Board of Charities had no suitable department for maintaining this work but he believed that it was the only department that could rightly take up this work.

Again the tax-payers are entitled to some consideration. There is no good reason why the City of New York should support feeble-minded persons in institutions when their relatives are well able to maintain them. It was for this reason that the framers of the New York City Charter placed the Randall's Island Institution for the feeble-minded under the jurisdiction of the Commissioner of Charities. This institution was intended primarily for the indigent, but where an inmate or his relatives is able to pay in part, or in full, for his maintenance, the Commissioner of Charities is empowered to collect such a sum and turn same over to the City Chamberlain once a month. He wished they could get the cooperation of all the agencies in the city, get them interested in the care of the feeble-minded; he then believed he could collect data which would be of value and would stimulate the authorities to make better provision for the care of the feeble-minded children.

MISS ELIZABETH E. FARRELL, Inspector of Ungraded Classes, in the Department of Education, New York City, said that she was there to represent the school system and to make plain the attitude of the school authorities in this matter of mentally defective children. The school in this regard is not doing a new work. It is merely

adapting its instruction to meet the needs of individual children. The history of education shows that whenever education was to be made more universal it met with serious opposition from those who belonged to the so-called educated classes. In our own city more than a hundred years ago, when the first public school was to be opened to all the children in the neighborhood, the cry went up that by educating all of the children we were cutting off the supply of persons who were to do the heavy work of the world. The men and women who were the citizens of New York City at that time deprecated, as do a few of to-day, the democratization of education. Education in a democracy is preparation for citizenship. As long as the citizens present infinite variety of intellectual power so long must the school meet the needs by differentiating its work. The fact of the matter is, that the school authorities of this city have during the past twelve years promoted the idea of adequate institutional care for a large number of children in the schools who never can be self-supporting and who ought never to be allowed to take a place, however small, in our highly organized city life. We feel that our work is one of demonstration only. As soon as the public understands that we have in the schools of this city children who will need supervision as long as they live, we will have adequate room and some sort of legal procedure for transferring such individuals to farm colonies. A large part of my time is given to the work of advising parents about the needs of their children. The medical inspection of children in ungraded classes is such that we know with a fair degree of accuracy the progress made by the children from year to year. Those children who do not improve are examined especially before the parents in order that they may appreciate the condition of the child. When the time is ripe the parent is advised to make application for the admission of his child to one of the state schools for the feeble-minded. Not one parent in ten follows the advice. As things are at present the parent alone can secure for the child institutional care. However much we appreciate the needs of any particular case we can advise only. I wish it to be perfectly plain what the attitude of the school authorities is in this regard. We do not want the idiots and the imbeciles. But we question the wisdom of those who would have us turn them into the streets. The option is not five hours a day in school or twenty-four hours a day in an institution; it is, rather, five hours a day in school or twenty-four hours a day on the street as beggars, peddlers, street gamins. The work which the school really wants to do, and which it will do as soon as it is relieved of the children who need custodial care, concerns those high-grade defective children who may by proper treatment, both medical and educational, be prepared to take a place in the community life. These are the children who in later life recruit the ranks of the insane. The schools want to make it impossible for the psychiatrist of the future to depend upon what individuals remember concerning the developmental period of life of these mental wrecks. We want the doctors of this city to regard the schools as laboratories. We want to gather such records of

school children as will help you in understanding the pitiful cases of psychoses that come to you for intelligent sympathy and help. I hope that the time of arguing whether or not the mentally defective children are really the concern of the public school is past. We must care for them until society realizes its duty to itself and its obligation to the weak. Then we shall have adequate institutional care, some court of last appeal before which the school as well as the parent will appear in the interests of the child. The idiot and the imbecile will disappear from the register of the public day school and their places will be taken by the high-grade boys and girls, who are so little understood and the saving of whom will add greatly to the wealth of the nation.

MR. HIBBARD, Ex-commissioner of Charities and Corrections, said that the subject of the care of the feeble-minded children was one of the most important subjects that could be considered and was one in which he had been engaged since it was first discussed in this state. Van Wagenen had made the statement, and the reports from the Carnegie Laboratory as well as reports emanating from Washington confirmed the statement, that there were 400,000 mental defectives in the state of New York, and of this number about 30,000 were idiots, imbeciles and low-grade feeble-minded. Of course it must be evident that the state of New York could never segregate such a large number of defectives. To be sure some of them were only slightly defective, unbalanced only along certain lines. But the state of New York should aim to care for all of the low-grade cases, the idiots, imbeciles, and low-grade feeble-minded. At the present time in the city of New York there were 6,000 of the 20,000 under public care, being paid for by the state or the various localities in the state. They need care for more than twice that number. But in the first place they wished to have these people of that strain kept out of the state so far as it was possible. He wished to help the Commissioner at Ellis Island in the examinations of immigrants to make sure that no person who was feeble-minded should be permitted to get into this country; if feeble-minded they should be sent back to where they originally belonged.

He agreed with Dr. Dana that a feeble-minded person with an inherited defective strain was more dangerous to this country than a person who was insane. They had much milder attacks, of course, especially when they got to the higher grades. The United States government should place at the disposal of the Commissioner of immigration the power to keep these people out of this country and officials throughout the state should have a similar power. If dependent, they should be sent back to where they came from. However, what they needed most of all was the public spirit that would help the institutions for the feeble-minded to get money enough to enlarge their facilities so that a larger number of these defectives could be cared for. They needed new institutions and especially in the western part of the state of New York for caring for this class of patients. Much had been accomplished through the efforts of Miss Farrell in establishing such institutions in Newark, Rome,

Syracuse; the Letchworth Village, being filled to its utmost capacity. In the institutions devoted to the care of epileptics it had been estimated at the Craig colony that 98 per cent. of the epileptics were feeble-minded. When one saw the forces at work to keep the feeble-minded children out of the state, he would believe they were making real progress. He did not think that a Board of Control, as advocated by Dr. Dana, was necessary or even desirable. There should be established a Board of Managers for these institutions; it was better, in his opinion, to avoid these Boards of Control because they were always likely to more or less enter into politics. Sufficient money should be had for the carrying on of this project. They needed some change in the law. It was sometimes quite easy to send these people to institutions but it was often very difficult to keep them there.

There was great need in this state of a place for the care of the delinquents, the mentally defectives; they should not be allowed to take the room in the reformatories where they would become a menace to discipline. A mental defective could never be reformed. They should also have in the city of New York and other large cities in this state large asylums for the reception and study of these delinquents. This was a subject that a body like the Section on Pediatrics of the New York Academy of Medicine could turn their attention to with profit. In the state of New York they had the best institutions for the care of the feeble-minded and one of the very best was the one situated on Randall's Island, but the Board of Estimate and Apportionment did not do its duty for this institution; it would not give the means sufficient for carrying on the work with this class in this institution. He believed that the State institutions were paid twice as much for the care of these unfortunates as was paid at Randall's Island. This was a matter which the Section on Pediatrics might take up. To sum the whole matter up, there was much work for the Department of Education and the Department of Charities; they should work together in this matter. All good citizens should be ready and willing to aid in this work and the work should be done thoroughly and well.

DR. L. PIERCE CLARK believed that the contention held by Dr. Dana held true; these children had not criminal potentialities; they were happy people and they should not try to use this bugaboo that the public seemed to insist upon because of the so-called potential criminal. A very important issue in this question was the economic one; the money paid by the tax payer was increased in amount and those in charge of the various asylums insisted that these feeble-minded children were going to become criminals or paranoiacs.

Dr. Clark agreed with the remarks of Mr. Hibbard regarding the Board of Control. At the Letchworth Village it was possible to receive this class of feeble-minded children. A census should be made in the state by which the number and whereabouts of these feeble-minded children could be determined; such a census should be kept on hand in order that they might know where these feeble-minded children were. Ten years ago it was estimated that there

were from 2,000 to 3,000 feeble-minded children in the city of New York but regarding this there seemed to be some doubt. But in going through the reports of the Board of Education it was found that a fair estimate of the number of feeble-minded in this city was from 6,000 to 7,000; this was an exact enumeration at the present time of the number of children that belonged to this defective class.

DR. S. PHILIP GOODHART believed that the most important class they had to deal with was the one that Dr. Sachs referred to; it was a class that required special attention. These might be called the higher defectives or rather the atypicals. Those do not require institutional care. These children are the most valuable as an asset to society since among them can be found those often possessed of certain special aptitudes, even of a high order. Unless they are recognized early and their training properly directed, they pass into the truly defective class. As practising physicians we are more concerned with this class. Their potentialities depend for development upon education and environment.

Feeble-mindedness in some cases is a *disease*, in that it may be dependent upon demonstrable pathological lesions in the brain. It is always a *condition* in the sense of its affecting social and economic problems.

DR. STOWELL agreed with Dr. Dana in what he said of the proper care and need for guidance of these unfortunates. They must have persons with normal minds to direct them and assume responsibility. Dr. Stowell disagreed with Dr. Schlapp and does not, like the latter, regard feeble-mindedness as a disease.

He believed that the Board of Education should have charge of all teaching whether of normal or feeble-minded, but that the feeble-minded should be in institutions, not the public school, especially while there are 90,000 pupils on part time.

The state must realize that accommodations must be provided for many times the number of feeble-minded now cared for.

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## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN.

**Congenital Family Cholemia.**—F. J. Poynton (*Proc. Roy. Soc. Med.*, 1912, vi, Sect. for study Dis. Child., 5) records a case observed in a girl of eight and one-half years who had been jaundiced since birth. Her father had also been jaundiced since birth. His children were: (1) Born jaundiced; died of "convulsions" at four months. (2) Twins; lived seven and eight hours only; cause of death unknown. (3) I. S., female, aged ten and one-half years, treated recently in hospital for incontinence of urine. While in hospital spleen was noticed to be enlarged slightly. Soon after admission she suffered from a very slight attack of jaundice of the conjunctivæ, with slight indisposition, and followed by a noticeable enlargement of the spleen,



which subsequently regained its former dimensions. This was the first time jaundice had been noticed in this patient. (4) S. S., age eight and one-half years; the patient here reported. (5) Dead child; six months, premature. (6) M. S., aged seven years; healthy; no enlargement of spleen now, and jaundice never noticed. Three years ago slight splenic enlargement.

There was no collateral family history of jaundice on the father's side, and the mother and the mother's family were free from the complaint. The patient reported by the writer showed variable slight jaundice, a palpable spleen, stools of normal color, and occasional urobilinuria but never bile pigment in the urine. The blood serum examined during an exacerbation of the jaundice was free from urobilin or bile pigment. The Wassermann test on the blood was negative, as it was also on that of her sister, I. S. The fragility of the red blood cells, tested on four separate occasions, gave readings of 0.6, 0.65, 0.65, and 0.65. Her father's fragility stood at 0.65 also; her sister's at 0.6. Her blood showed secondary anemia of moderate degree. An interesting feature was the demonstration in the blood by Pappenheim's "vital" staining process of "hematies granuleuses" or "reticulated red cells" in considerable numbers. These occur in normal blood in a proportion of 1 to 2 per cent. of the red cells, but are very numerous in fetal blood, diminishing rapidly toward term. They are increased in numbers in many forms of severe anemia, and are a particularly constant feature of the blood picture in acholuric family jaundice. In the patient's blood they totalled 10 per cent., 8.4 per cent., and 11 per cent. of the red cells on three occasions. In her father's blood they stood at 6 per cent., and in her sister's at 5 per cent. In her sister, who was free from jaundice, only 0.2 per cent. of reticulated red cells were found. These reticulated red cells are to be regarded as evidence of very rapid blood regeneration. The patient was treated by the application of x-rays to the splenic region three times weekly, and appeared to be much improved, the spleen becoming distinctly smaller and the jaundice less.

**Excision of Spleen for Congenital Family Cholemia.**—The patient whose case is reported by C. R. Box (*Proc. Roy. Soc. Med.*, 1912, vi, Sect. for study Dis. Child., 8) was a girl of twelve years. Her mother had suffered from the same disease since girlhood. A sister had anemia and splenic enlargement. A younger brother also had an enlarged spleen, but showed slight polycythemia. The patient was jaundiced for six weeks after birth and had had an enlarged spleen since infancy. She had always been delicate. Five years ago a purpuric eruption appeared on her legs, and this recurred the following year. During the purpura she vomited some blood and also passed some bright blood by the bowel. For the past four years there had been recurrent attacks of persistent vomiting accompanied by pain in the left side of the abdomen, splenic swelling, and jaundice. Latterly the jaundice had been constant, although varying in depth. There was no bile in the urine but plenty in the stools. Her blood always showed a moderate anemia, with a low color index. Anisocytosis had been noticed, but not marked. Normoblasts had been seen on



one occasion (when the purpura was present). The leukocyte count was 15,800 in her second year, the polynuclear cells and lymphocytes being approximately equal. The spleen was excised. It weighed 390 grams, and showed moderate perisplenitis. The splenic tissue had undergone some fibrosis, and the sinuses were dilated. There was no evidence of increased splenic activity and no reaction for free iron could be obtained. A week after operation the patient's condition became critical and remained so for another week. Her temperature gradually rose to nearly 105° F.; vomiting of bilious matter was incessant, the pulse was very rapid, and complaint was made of severe pain in the joints, but there was no joint swelling. Five weeks after operation she was convalescent, and the daffodil tint of her skin had quite disappeared. Hemolysis still began with 0.5 per cent. saline. Blood examinations showed:

	Before splenectomy	Twelve days later	Five weeks after operation
Red cells . . . . .	3,337,500 . .	4,950,000 . .	3,868,750
White cells . . . . .	10,640 . .	6,220 . .	21,280
Hemoglobin . . . . .	65 per cent. . .	80 per cent. . .	75 per cent.
Color index . . . . .	0.9 . .	0.8 . .	0.9
Polynuclear cells . . . . .	50.0 per cent. . .	76.75 per cent. . .	50.25 per cent.
Polynuclear eosinophiles . . . . .	2.25 per cent. . .	3.75 per cent. . .	13.5 per cent.
Small lymphocytes . . . . .	40.0 per cent. . .	14.0 per cent. . .	25.25 per cent.
Large lymphocytes . . . . .	3.75 per cent. . .	0.75 per cent. . .	3.75 per cent.
Large hyaline cells . . . . .	3.5 per cent. . .	5.75 per cent. . .	6.0 per cent.
Mast cells . . . . .	— . .	— . .	1.25 per cent.

Subsequently, after albumin and casts had been noticed in the urine for a few days, uremic convulsions set in and soon terminated fatally. Post mortem a small abscess was found in the splenic stump and acute inflammation of the kidneys. The liver contained much free iron.

**Pyloric Stenosis and Muscular Hypertrophy in Infants.**—Ribadeau-Dumas and Boncompain (*Prog. mèd.*, Nov. 2, 1912) says that pyloric stenosis is not rare in infants. Exceptional causes are congenital pyloric atresia, and stricture of the small intestine by tumors polypi and carcinoma, while muscular hypertrophy is not rare. The symptoms of pyloric stenosis are incoercible vomiting, occurring in an infant after a period of some three weeks after birth of normal feeding, the vomiting being expulsive, and progressive emaciation. It requires a special diet, and in a few cases has been found curable. The vomiting is explosive, it often occurs only after two or more feedings, some of the elements of the first feeding being contained in the vomited material. The stomach becomes dilated and the vomitings are very large. They may be streaked with blood from erosions of the stomach lining. Constipation is obstinate and in the late stage of the disease a catarrhal enteritis may come on. Oliguria is constant. We may be able to see through the abdominal walls peristaltic waves, and to feel a pyloric tumor. A bismuth meal given previously permits the determination by the x-rays of the size and shape of the stomach, which is often contracted toward the middle of the organ, the cavity becoming divided into two segments. The

author gives x-ray pictures from two cases examined. There is found at autopsy hypertrophy of the muscle around the pylorus in the form of a rosette. Without added spasm of the pyloric orifice the hypertrophy alone would not cause stenosis. Medical treatment will consist in special diet, and feeding by a tube which has passed through the pyloric orifice. Some authors remove all fat from the milk, believing it a cause of emesis. Antispasmodic medication has its place in treatment, but dosage must be regulated with great caution in these young subjects. Daily lavage has given good results. Surgical treatment consists of one of the methods of making an entrance from the stomach to the small intestine, gastroenterostomy being preferred.

**Pneumococcus Cerebrospinal Meningitis in Infants.**—Geo. Dujol (*Prog. mèd.*, Nov. 30, 1912) says that while meningitis from pneumococcus infection is benign in children over two years of age, in infants it is peculiarly fatal, and often accompanied by cerebral infection. The author details two cases showing these facts. Although this affection in infants is not frequent, it occurs more often than has been supposed. Acute meningitis in infants is predisposed to, according to Netter, by the great vulnerability of the brain, which is badly protected by thin bones, combined with a marked nutritive activity. The germs may enter through the mucous membranes of the nose, throat, or mouth, the conjunctiva, ears, or the umbilicus. They may also be transmitted by the blood, from the placenta, by the milk or through the respiratory organs, and carried by infection from other patients. This form of meningitis is generally cerebrospinal in its extent, the cerebellum being involved as well. Pneumococcus infection of the brain is frequent in infants affected by heredo-syphilis, tuberculosis, and children of alcoholics. The first thing noted is refusal to eat, with a choryza. A sudden onset with convulsions is frequent. Temperature is high, urine scarce, and pulse rapid. Then come constipation, ocular symptoms, Kernig sign, hyperesthesia, convulsions, and contractures. In the fluid from lumbar puncture are found pneumococci, a few lymphocytes, many of which are polynuclears. The course of the disease is very rapid and it is almost always fatal. Treatment is of little avail.

**Defective Children.**—Raoul Dupuy (*Jour. de mèd. des enf.*, No. 47, 1912) defines defectives as children who by reason of lessened intelligence or inaptitude are unable to learn school lessons in the manner of normal children. They have increased in numbers so much as to threaten the intellectual and moral future of the race. They develop into inefficient, useless people, or into the vicious, criminal, and prostitute classes. They have perversions of instinct, judgment, and moral sense. Classes for assistance for these people (*classes de perfectionnement*) have been established by law in France in various places, to which are admitted the apathetic and the unstable, in order that they may be adequately taught and made as useful as is possible to the community. These persons cannot be picked out by a single examination; they must be observed often for some time before being committed to institutions. They must undergo

certain tests to differentiate them from the lazy, the ignorant, and the unruly. We also encounter in some families a pride which makes it difficult to admit that these children are mentally defective, and causes them to absolutely refuse to "class them with idiots and imbeciles." There are school principals who from fear, indifference, or vanity will not acknowledge that these pupils cannot be taught in the ordinary way. To teach these pupils we must pass from the abstract to the concrete, use the senses, not the intelligence, and make lessons of all the ordinary acts of life. The zeal, patience, and self-abnegation of the instructors is remarkable. These true defectives are defective in body as well as in mind. The evolution of the body is interrupted, and we find as great physical as mental defects. The arterial pressure is low, assimilation is disordered, elimination, and retention are abnormal, the action of kidney and liver are bad, blood composition is abnormal, and ossification is retarded. The causes of retardation are numerous. There may be arrest of development of the brain, and thrombosis or rupture of the arteries, meningoencephalitis, and exaggerated secretion of cerebrospinal fluid. In many cases, however, there is no abnormality of the brain, and the cause of retardation is extracerebral. Nutrition and circulation are under the direct influence of the sympathetic system of which the glands of internal secretion are the excitomotor directors. They have a marked effect on development, nutrition, and growth. Many of these defective conditions may be improved by the use of "polyopotherapy-endocranienne." Often the defect is mixed, that is, it is glandular and cerebral at the same time. This treatment results in increase in height, increase of blood pressure, regularization of the organic exchanges, and development of ideation, attention, speech, will, cerebral action and coordination of ideas. The author believes that the state should distribute these glandular extracts freely to be used in the treatment of these defectives, as is done in Hungary for the cretins, who have diminished in number under this treatment. These children should be segregated from their families while under treatment so that they may be better controlled and their nutrition supervised. They should be given lime, potash, soda, and magnesia as well as glandular extracts; and friction, massage, respiratory gymnastics, and hydrotherapy should be used. There should be special as well as ordinary medical care. Oculists and aurists should treat eyes, nose, throats and ears. The rôle of the physician is most important in the care and education of these defectives, for the body as well as mind must be developed and supervised. There should be a regular corps of medical inspectors in each school to supervise the medical treatment; but treatment of these children should begin as soon as the defect is recognized, not when they enter school. Institutions for the care of these children should include a service of observation, a nursery, a maternal school, and a school for adults.

**Retropharyngeal Abscess in the First Year of Life.**-- J. Danboy (*Arch. de méd. des enf.*, Dec., 1912) says that retropharyngeal abscess, involving the glands at the base of the skull occurs in children, and

is fatal when the diagnosis is not made and the abscess incised. The infection appears to come through an abrasion of the mucous membrane. It rarely opens spontaneously, and death may result from asphyxia, inanition, general infection, or a pleuropulmonary complication. The symptoms are difficult respiration, nasal voice and cry, pain shown on movements of the head, cyanosis and oppression, inclination of the head to one side and swelling of the glands of the neck. The swelling in the pharynx can be felt by introducing the finger into the pharynx. Hot irrigations of the throat give some relief and remove the mucus which pours from the irritated mucous membrane. Incision of the abscess is the only curative treatment, followed by hot irrigations. The incision may close and have to be reopened.

**Helminthiasis in Children.**—W. W. Murphy (*Amer. Jour. Dis. Child.* 1912, iv, 378) says that careful examination of the stools from 102 children from two to twelve years of age showed that 6.86 per cent. were infected with intestinal parasites. In one case there was a double infection giving a total of eight infections. Schloss, of New York, from 280 examinations reports 28.57 per cent., and Stiles and Garrison from 123 examinations report 21.14 per cent. Four (3.92 per cent.) of the cases were *Trichiuris trichiura* infection; two (1.96 per cent.) were *Ascaris lumbricoides* infections; one (0.98 per cent.) was a *Tania saginata*, and one (0.98 per cent.) was a *Trichimonas intestinalis*. Comparing these with the relative frequency shown in other reports, the results are found very similar for these three species of parasites. In all reports, the *Trichiuris trichiura* is three to four times as prevalent as any other parasite. The *Ascaris* is usually mentioned as one of the most common intestinal worms, but the more recent reports seem to disprove this view; the report of Stiles and Garrison showing only 0.81 per cent. of cases harboring this worm. Only a small percentage of cases infected with intestinal parasites display any obvious symptoms. Eosinophilia was not constant as a symptom of helminthiasis, but when present, it accompanied the other clinical manifestations. Further, its presence bore no relation to the species of parasite harbored.

**Diagnosis of the Somnolent Form of Uremia, in the Nursling, from Tuberculous Meningitis.**—Nobecourt (*Ann. de mèd. des enf.*, Dec., 1912) says that there is a type of uremia in infants which may be called somnolent, which simulates tuberculous meningitis, and is difficult to differentiate from it. Examination of the cerebrospinal fluid shows the presence of an abnormal amount of urea, which will not be found with meningitis. Uremia may be accompanied by meningitic symptoms, sometimes contractures and ocular symptoms. In these cases the trouble begins with vomiting and badly digested stools, or diarrhea; the child loses appetite, and grows thin. Then stupor comes on; the child is hard to arouse for food or drink; his eyes are half closed, fixed, and look at nothing. Emaciation is progressive and extreme. A flame passed before the eyes is, however, followed slowly, which would not be the case in meningitis. There is no loss of conjunctival reflex. In uremia the pulse is little changed, but the

respiration is altered in rhythm, sometimes to the Cheyne-Stokes type. There is little difference in the temperature curve of somnolent uremia and meningitis. In meningitis there may be apyrexia. The decisive element in diagnosis is the finding of an excess of urea in the cerebrospinal fluid.

**Remarkable Improvement in Severe Chorea Treated with Salvarsan by Rectum.**—Weill, Mouriquand, and Goyet (*Arch. de méd. des enf.*, Dec., 1912) record the excellent effect of salvarsan used by rectum in a very severe and intractable case of chorea, which was not at all benefited by arsenic given by mouth. The child was never still; the motions were severe and wearing and had increased in violence for some time. The general condition was deplorable emaciation extreme, and it was necessary to feed the child. The first two injections of salvarsan with laudanum were retained for but one hour each, still there was some effect, but the third was retained for seven hours, and the effect was marked on the second day. She was then able to lie quiet in bed, with only slight movements of the limbs. Questions could be answered and food taken. Appetite returned and the child was in better spirits.

**Rectal Absorption of Salvarsan by Children.**—Weill, Morel, and Mouriquand (*Arch. de méd. des enf.*, Dec., 1912) give their reasons, based on clinical experimental data for believing that salvarsan is absorbed by the rectum. In children it is difficult to find the veins, and intravenous injection has some dangers. Absorption of salvarsan by the rectum is slower but still sure, and as rapid action is rarely necessary, this is a much better method of administration. Ten to forty centigrams of salvarsan have been injected by rectum. Caustic soda is used to neutralize the acidity, and physiological serum is added with a few drops of laudanum. The drug thus used gave marked amelioration in heredo-syphilis and severe chorea.

**Congenital Myotonia of Oppenheim.**—Raoul Duthoit (*Arch. de méd. des enf.*, Dec., 1912) has collected all the examples of congenital myotonia that have been published since the diagnosis was made by Oppenheim in 1900, and adding one case of his own, gives a study of the disease. In all, sixty-eight cases have been published, with twelve autopsies. Death has been from outside respiratory disorders generally. The disease consists of a hypotonic condition of the muscles of the legs and arms, most marked in the legs, extending sometimes to the muscles of the neck and thorax, but never involving those of the tongue, eyes, the diaphragm or of deglutition. The condition sometimes amounts to a complete paralysis of the affected muscles; voluntary movements are weak if present; the electrical reactions show degeneration, and the reflexes are abolished. There is no involvement of sensibility or of brain functions. The face is rarely involved. There is a marked relaxation of the articulations, permitting of exaggerated hyperextension. The sphincters are not affected. Autopsy has shown a lesion of the cells and anterior horns of the spinal cord and the fibers which go to form the anterior roots and peripheral nerves, accompanied by sclerosis of the muscles, thyroid and thymus. The cause is unknown, although the condition



is always congenital. The course of the disease has not as yet been sufficiently observed, for it is but twelve years since the condition was diagnosed and named by Oppenheim, thus the patients are not yet grown up. Of fifty-three our classification of cases, twenty-one have died, twenty-one are improved, and eleven are in the same condition as when first observed. While not in itself fatal the weakness resulting from this disease exposes the patient to intercurrent diseases. The administration of thyroid has been of some apparent value. Arsenic and strychnia have also seemed of some little use.

**Sudden Death of Heredo-syphilitic Infants soon after Birth.**—

A. Bonnet-Laborderie (*Jour. des sci. mèd. de Lille*, Dec. 3, 1912) says that in death in heredo-syphilis immediately after birth autopsies have given most contradictory results. In many cases there are grave syphilitic lesions in the viscera, while in others most minute research gives no syphilitic signs. Still the spirochate pallida can generally be demonstrated in the blood, showing a general infection. Some of these infants appear quite normal, and it is a surprise to the accoucheur when the infant does not breathe. There must be some special mechanism causing death which is active only just at the beginning of respiration. These infants have an exaggerated development of the abdomen, the internal organs having undergone hypertrophy. This condition has been called a glandular splanchnomegaly. In many cases there is also ascites adding to the distention of the abdomen. These enlarged organs make undue pressure on the contents of the thorax, and make it difficult for the lungs to be inflated when the infant should begin to breathe. The type of respiration in the new-born babe is abdominal, the thorax having little movement therefore, the upward pressure of the distended abdomen will interfere with the respiratory action of the diaphragm. The cries and respiratory efforts of the heredo-syphilitic are feeble and last but a few minutes. In spite of the feeble efforts at respiration that are made no air enters the thorax, and death results. At autopsy the lungs are found in a state of atelectasis. The heart may beat for several minutes after the respiratory efforts have ceased. The efforts to establish respiration fail. In cases in which the abdominal organs are not markedly enlarged and ascites is responsible for the distention, tapping of the abdomen and removal of fluid suggests itself as of value in relieving pressure.

**Rupture of the Bile Ducts by Contusion of the Abdomen in an Infant.**—C. Lopoutre (*Jour. des sci. mèd. de Lille*, Dec. 14, 1912) gives the history of an infant who sustained rupture of the bile ducts after an injury of the abdomen, and in whom operation brought about a recovery. The author states that when the bile remains aseptic there is no serious rise of temperature or reaction. Owing to the fact that the bile passes freely into the abdomen it is not carried into the circulation and jaundice does not occur at once. The feces are colorless. There is no peritonitis, yet many adhesions may be formed between the viscera. In some cases the bile is absorbed by the peritoneum. In others the absorptive power of the peritoneum is lost. There are few symptoms of rupture when asepsis is preserved



and the outflow of a large amount of bile at operation is a surprise to the surgeon. The physical signs are those of simple ascites, the bile, flowing to the lower part of the abdominal cavity. A puncture of the abdomen will clear up the diagnosis. The opening into the bile ducts may close spontaneously and the bile remaining in the abdomen be absorbed, the patient recovering. If this does not occur an exploratory operation is indicated, the lesion being closed, and abdomen sutured.

**Epidemic Poliomyelitis.**—By injecting a monkey with the filtrate of saline solution which had been used for nasopharyngeal irrigations of the father and mother of a child suffering from epidemic poliomyelitis, S. Flexner and P. F. Clark (*Jour. A. M. A.*, 1913, lx, 201) succeeded in producing this disease in the animal. The result brings indubitable evidence of the occurrence of the virus of the disease in the nasopharynx of healthy persons who have been in close contact with an acute case of poliomyelitis, and affords an experimental basis for the belief, based on clinical observation, of the occurrence of passive human carriers of the infection.

**Employing the Methods Used by Noguchi in the Cultivation of Spirochetes.**—S. Flexner and H. Noguchi (*Jour. A. M. A.*, lx, 362) have succeeded in cultivating the etiological organism of epidemic poliomyelitis. These proved to be globular or globoid bodies, averaging in young cultures 0.15 to 0.3 micron in size. The bodies appear in a variety of arrangements: single, double, short chains and masses. Often they appear embedded in a material of different refractive index. In older cultures certain bizarre forms have been noted. The cultivated bodies stain a pale reddish violet in Giemsa's solution, and bodies of identical appearance have been demonstrated by Noguchi, also with Giemsa's solution, by a specially devised method in films prepared directly from the nervous tissues. They pass readily through Berkefeld filters. The writers employed tissues from the brain and spinal cord of human beings who had died of epidemic poliomyelitis, and of monkeys the subjects of the experimental disease. Part of the tissues had been preserved for many months in 50 per cent. glycerin solution and were free from ordinary bacterial contamination, as were the fresh tissues. The cultivations were conducted both with Berkefeld filtrates and tissues in substance. The culture mediums consisted, first, of sterile, unfiltered ascitic fluid or of brain extract to which fragments of sterile rabbit kidney and a layer of paraffin oil had been added, and of these plus 2 per cent. nutrient agar-agar in proportions of 1 to 2. The first mediums permit of a slow growth not visible to the naked eye, while the second (which are unsuitable for obtaining the initial growth) yield, after several days, visible minute colonies clouding the tubes. The cultivations are conducted under anaerobic conditions, and the colonies do not ascend to the summit of the deep layer of solid medium. Injection of these cultures caused typical poliomyelitis in monkeys, confirmed by autopsy and other inoculations.

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### ORIGINAL COMMUNICATIONS.

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#### INFLUENCE OF THE OVARY AS AN ORGAN OF INTERNAL SECRETION.\*

BY

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THE ancient idea that the physical and mental processes of a woman are under the domination of her womb has in the light of modern research given way to the theory that the uterus and those functions which it was formerly supposed to influence are in reality presided over by the ovaries through the medium of an internal secretion. This new knowledge bids fair to introduce the science of gynecology to a new era of progress and activity for it is almost the first light that has been shed on the physiology of the functions of the female pelvic organs, a subject which though involving problems of the deepest vital importance, has been heretofore shrouded in almost complete darkness.

The study of the organs of internal secretion is of such surpassing interest and lends itself to such limitless possibilities of original experimental research and theoretic speculation that the eager investigators in this line have flooded the literature with a vast amount of undigested material. It is the purpose of this paper to review briefly the present status of our knowledge concerning the physiology of the ovary and to emphasize such points as may be of practical use to us in the treatment of gynecological patients.

In reviewing the work of experimenters and theorists who have treated the subject of the internal secretion of the ovary, it must be admitted that many of the results are flatly contradictory, that

\*.Read before the New York Obstetrical Society, January 14, 1913.

the enthusiasm of many writers does not seem to be justified by the actual clinical facts and that the total resultant of practical useful knowledge gained from all this investigation is at present extremely small.

#### ANATOMICAL EVIDENCE.

Our first inquiry in the study of the subject is as to whether there exists any definite anatomical evidence that the ovary is actually an organ of internal secretion.

There are three structures in the ovary which may be considered as possible carriers of the internal secretion, namely, the follicle apparatus, the corpus luteum, and the so-called interstitial gland. Of the follicle apparatus little is known, experimentation on these bodies being inconclusive on account of the difficulty of excluding the influence of the corpus luteum or the secretion of the atretic follicles. It may be said, however, that the anatomical structure of the follicle apparatus is not of the type which characterizes the true glands of internal secretion.

In the structure of the corpus luteum on the other hand, there are elements which closely resemble those of the internal secretory glands, especially the adrenals. It is at present generally accepted that the large lutein cells result from a proliferation of the epithelial granulosa cells that line the follicle. During the development of the corpus luteum, the theca interna or connective-tissue layer which lies next to the granulosa sends small blood-vessels into the mass of lutein cells. The resultant picture of large epithelial cells with pale-staining nuclei lying in close contact with small thin-walled blood-vessels corresponds closely to the structure appearance commonly regarded as characteristic of organs of internal secretion.

You are all doubtless familiar with the experiments of Fraenkel who claimed to have proved that the corpus luteum by its internal secretion presides completely over menstruation, the preparation of the endometrium for the reception of the impregnated ovum, the maintenance of the integrity of the uterus and finally the development of the fetus. Some of Fraenkel's work has been confirmed and much of it contradicted by other investigators. The theory that the corpus luteum is essential for the development of the fetus, at least during the early part of pregnancy seems to be generally supported (most recently by Dick and Curtis, *Surg., Gyn., Obst.*, November, 1912) and may be accepted with reasonable assurance, while his other conclusions are probably correct, even though not proved beyond objection.

Novak says "In reviewing the results of investigation up to the present time we must conclude that the histological structure of the corpus luteum makes an internal secretion of this organ probable but that thus far there has been brought forward no incontestable proof of its specific manifestations."

It should also be remarked in this connection that the epithelial origin of the lutein cells is at present not entirely beyond dispute and that there are some who still believe that these cells are derived from the connective-tissue cells of the theca interna. If the lutein cells should prove to be of connective-tissue origin the probability of an internal secretion in this organ would be much lessened.

The third structure of the ovary which may carry an internal secretion is the interstitial gland. This is a structure which appears more prominently in some animals than in others, and its occurrence seems to be vicarious with that of the corpus luteum; that is, in those animals in which the interstitial gland develops prominently the corpus luteum is in little evidence and *vice versa*. The interstitial gland represents a luteal reaction of the cells of the theca interna coupled with a loss of the granulosa, and its function probably corresponds in general to that of the corpus luteum. A well-developed interstitial gland such as is seen in rabbits has the appearance of a gland of internal secretion, but it should be remembered that the cells are connective tissue in origin, and are thus atypical of secretory cells. Very little is known of the interstitial gland.

It will thus be seen that the corpus luteum has the greatest claim from a histological standpoint of being the chief center in the ovary for the manufacture of an internal secretion. When we consider that the corpus luteum functionates only from the age of puberty to the climacteric it must be admitted that aside from its probable relation to menstruation and pregnancy its internal secretion can have no very profound influence on the general organism of a woman for the physical and mental characters of femininity remain stable throughout life, other things being equal.

#### HYPOFUNCTION OF THE OVARIES.

Our next inquiry is concerning the effect on the organism of an absent or limited functioning of the ovaries. It includes a consideration of the effect of early castration, and of the various conditions of hypoplasia or infantilism formerly supposed to be due to an ovarian deficiency.

*Castration.*—There is suprisingly little knowledge of the effect on females of castration done before sexual maturity. Nearly all generalizations on the subject have been from observations of castrated males. In human beings information on this subject is gained chiefly from a study of the eunuchs of the Turkish harems, and from a religious sect in Russia called the Skops. It may be said that the body length of individuals who have been castrated early in general exceeds that of the noncastrated, an observation which is familiar in animals also, as in the case of oxen, geldings and capons. Tandler and Gross and others (*Wiener klin. Woch.*, 1908, p. 277) ascribe this fact to a delayed ossification of the epiphyseal joints, which produces not only an increase in growth, but a deviation from the normal body proportions. The result is that the individual produced by early castration is not of the infantile type, but on the contrary far removed from it. While we find in children a relatively long trunk and short extremities, and a proportionately large skull, with small face, we find in the castrated a marked increase in the length of the extremities, and a skull relatively small in comparison with the face. These gross physical changes are constantly observed, both in man and in animals, and it is not surprising therefore to find that there also constantly exists an enlargement of the sella turcica, due to hypertrophy of the hypophysis. It is therefore seen that the genital glands may bear an antagonistic relationship to the hypophysis, and that the early removal of the inhibitory influence of the testis, or ovary, allows for an overdevelopment of the hypophysis with corresponding manifestations suggestive of gigantism or acromegaly.

Whether the effect of early castration in the female is identical with that in the male in the human species does not seem to have been determined accurately. There is some evidence to show that the removal of the ovary is attended with considerably less constitutional change than is the removal of the testis.

*Infantilism.*—Of far greater practical importance is the subject of infantilism. Infantilism relates to arrested development of various parts of the body and may manifest itself universally in all parts of the body (*infantilismus universalis*) or it may appear only locally (*infantilismus partialis*). The manifestations of the condition in which we are particularly interested are those that are seen in connection with the abdominal and pelvic organs, and with the external female genitals for some of them are of great clinical importance to the surgeon. Some of the familiar stigmata of the infantile or hypoplastic condition in the abdomen are enteroptosis,

abnormal mobility of cecum and sigmoid, prolapse of the kidney, pelvic kidney, short appendiculoovarian ligament, funnel-shaped appendix, etc. In the pelvis there are the congenital or developmental uterine malpositions of retroflexion, acute antelexion, antelexion with retrocession, and procidentia, all of which may cause clinical symptoms. In addition to this are the anomalies due to the failure of complete union of the Müllerian ducts causing the various forms of uterus didelphys and atresia, some of which may result in serious surgical complications. It was formerly supposed that these manifestations of infantilism were due to a deficient development of the ovary from the fact that the ovary is sometimes found hypoplastic. The present theory (Wolff, *Arch. f. Gyn.*, 1911, Bd. xciv, Hft. 2, Bartel, Herrmann, and others) is that the local stigmata of infantilism such as are seen in the genitalia are merely manifestations of a general "hypoplastic constitution," and that hypoplasia of the ovary when it occurs is only an incident, and not a cause of the general condition. In the great majority of these cases the uterus is distinctly infantile but the ovaries are either normal or actually larger than normal (excluding the occurrence of cystic degeneration or thickened albuginea). According to E. Herrmann (*Centr. f. Phys.*, 1909, Bd. xxiii, No. 8) the ovaries are enlarged in about 58 per cent. of cases of hypoplastic constitution.

It is sufficiently evident therefore that infantilism is not necessarily due to ovarian deficiency. On the other hand full development of the secondary characters may occur even in the presence of complete absence of the ovaries. This is most commonly observed in cases of deficient union of the Müllerian ducts in which according to Burrage the ovaries are completely absent in 18 per cent.

We are all familiar with the cases of absence of the vagina in which uterus and ovaries are either absent or only rudimentary. Many of these women are in every other way fully developed sexually and are sought in marriage; hence the not infrequent necessity of the operation for making an artificial vagina.

When we consider, therefore, that in a large percentage of cases infantilism or hypoplasia occurs in the presence of normal or enlarged ovaries, and that full secondary sexual development may occur with deficient or absent ovaries it must be admitted that the ovarian secretion cannot influence to any great extent the general or special development of the organism. We should expect also that early castration of the female of the human species would have less organic effect on development than it does in the male.



## INFLUENCE OF ATROPHY OR REMOVAL AFTER MATURITY.

Although up to the time of puberty the ovaries seem to have but moderate local or constitutional effect we find definite evidence to show that during the child-bearing and menstrual period of life, the ovaries not only exercise a distinct trophic influence over the uterus and external genitals, but they seem to play a certain more or less important part in the general chemistry of the organism. This is best seen in the atrophy of the uterus and external genitals which takes place when the ovaries become atrophied or are removed after attaining the period of full maturity. When atrophy of the ovary takes place the organ becomes shrunken in size, the follicles cease to ripen and degenerative changes appear in the follicle apparatus. The condition when complete is manifested by amenorrhea. The uterus becomes small and flaccid, the cervix is shrunken and flattened. The labia become less full and rounded, the minora are slender and less prominent and finally disappear entirely. The vaginal and vulvar mucous membrane is pale, inelastic and contracted and may give rise to most distressing symptoms. Physiologically ovarian atrophy appears at the menopause and during lactation.

According to Thorn (*Gyn. Rundschau*, 1907) lactation-atrophy of the ovaries with secondary atrophy of the uterus is a constant phenomenon in nursing women. Fraenkel describes it as appearing during the third month after childbirth, and as disappearing in the seventh month even if the mother continues to nurse. Foges (*Wien. klin. Woch.*, 1908, No. 5) has shown that this atrophy is due to a cessation of the function of the ovaries and not to the nursing of the mother. Secondary atrophy of the external genitals after childbirth is often seen and I have encountered it in cases during perineal operations a few months after parturition where the nonelasticity of the tissues suggested strongly the conditions met with in such operations performed after the menopause.

Pathological ovarian atrophy as indicated by secondary atrophy of the other genitals is said to follow local pelvic conditions of inflammation and tumor formation but from my observations this must be rare, for in most of these cases the ovarian tissue continues to functionate. The same result is said to follow infectious and constitutional diseases such as scarlet fever, articular rheumatism, diseases of the thyroid, anemias, paralyses, etc.

The secondary atrophy of the external genitals following castration is an important factor to consider in the performance of hyster-

ectomy operations. Those of us who have performed extensive plastic operations of the vagina in conjunction with hysterio-oophorectomy have had good cause to appreciate the uncomfortable consequences of such a procedure. On the other hand in cases of severe procidentia in the operation that I am accustomed to perform which includes a supravaginal hysterectomy with interposition of the cervical stump, I have found that a proper allowance for the succeeding atrophy of the vaginal mucous membrane is of great help in bringing about a permanent cure of the prolapse of the vaginal walls.

#### HYPERFUNCTION OF THE OVARIES.

The hyperfunction of the ovarian internal secretion is a subject which has produced an enormous amount of theoretic speculation, and the theory is so attractive and plausible that there is a tendency among many writers, more especially the French, to explain in this way all the unsolved problems of gynecological science. It is important therefore to emphasize the fact that the subject is at present largely in the theoretic stage, and to sound a warning not to put too much confidence in the promises which it holds forth.

The most important phase of the theory is that which is applied to the hitherto unexplained phenomenon of uterine bleeding in cases of uterine myomata and so-called uterine insufficiency. The theories which explained these uterine bleedings by the anatomical conditions of endometritis, glandular hypertrophy, chronic metritis, chronic oophoritis, small cystic degeneration of the ovaries, etc., have all been for the most part exploded. The present tendency is to solve the problem by studying the physiology of the ovary on the hypothesis that the function of menstruation is regulated by the internal secretion of the ovary. The following is briefly the course of reasoning:

The functions of the uterus are under the control of the ovaries, for without the ovaries there is no true menstruation. During menstruation the blood-vessels of the uterus, and especially of the endometrium, are always dilated, and the normal menstrual blood is uncoagulable. It is supposed therefore that there is manufactured in the ovaries as an internal secretion a substance which passes over into the uterus in the blood, and which, when enough of it has accumulated, produces the phenomenon of menstruation by dilating the capillaries of the endometrium and reducing the coagulability of the blood.

The substance (probably by chemical influence) acts on the walls

of the small blood-vessels of the endometrium, causing a hyaline change which makes them more permeable for the passage of the blood. The menstrual bleeding stops when the active substance which causes dilatation of the blood-vessels and uncoagulability of the blood is eliminated by the flow. The ovaries continue to manufacture the substance, which in turn continues to flow over into the uterus until enough is accumulated to produce again the menstrual discharge. By this theory, therefore, abnormal uterine bleeding is easily explained by the storage in the uterus of an excessive amount of ovarian secretion.

This theory is not without scientific substantiation. Of very great interest are the experiments of Schickele (*Arch. f. Gyn.*, Bd. xcvi, 1912) on the influence of uterine and ovarian extracts on the time coagulability of the blood.

He made extracts of the uterus, endometrium and ovaries that had been removed for various causes at surgical operations, and adding them to combinations of animal blood serum and plasma, observed the changes in the time of coagulation as compared with normal controls. From these investigations he proved that extracts of the uterus and ovaries delay the coagulation. In those cases where the extracts were made from organs in which abnormal bleeding had not existed he found that the ovarian extract caused a greater delay than did that from the uterus. In those cases where there had been severe menorrhagia or other hemorrhages, the effect of the uterine extract was more powerful than that of the ovaries. Moreover, he showed in these cases that the extract from the endometrium was more powerful than that from the myometrium.

The general conclusion was that extracts from organs in which the menstruation had been unduly prolonged caused a greater delay in blood coagulation than did the extracts from organs where menstruation had been normal.

Schickele also tried the effect of these extracts on blood pressure and found that they caused a dilatation of the peripheral blood-vessels, with consequent lowering of blood pressure. He found also that this lowering of blood pressure was inhibited by previous injections of adrenalin or pituitrin, and *vice versa*. He then compared the foregoing results with the effect produced by the extracts of other organs of internal secretion on blood coagulation and found that, though similar results could be attained, they were distinctly less intensive than those derived from the extracts of ovary and uterus. Experiments with menstrual blood produced results similar to those with the ovarian and uterine extracts.

The conclusion from the investigations of Schickele and others seems to be, therefore, that in the ovaries is produced a substance that is passed over to and stored in the uterus and endometrium, which has the power of local dilatation of the blood-vessels and of delaying or preventing the coagulation of the blood.

The experiments of Schickele must be regarded with caution. It should be noted that the work on blood coagulation was done *in vitro*, whereas it has been shown that such blood reactions often act in an entirely opposite way in the living. Moreover Kiutsi (*Monatsschr. f. Geb. u. Gyn.*, Oct., 1912) has shown that human corpus lutein extract causes immediate clotting of freshly drawn human blood. He ascribes his results to his particular method of removing and extracting the corpus luteum so as to exclude the influence of other parts of the ovary.

#### EVIDENCE FROM THE X-RAY.

The theory that pathological uterine bleeding is due to ovarian hypersection has some support from the beneficial results of the x-ray on patients with bleeding myomata, or with uterine insufficiency. These results as reported by Reifferscheid, Fraenkel, Krönig, Gauss, and others have been such as to attract world-wide attention. It has been shown that the destructive effect which the x-ray has on the parenchyma of the ovary is sufficient often to control the uterine hemorrhages.

#### TRANSPLANTATION OF OVARIES.

The persistence of the ovarian function after transplantation has been used as one of the chief arguments in support of the theory of internal secretion. The results of experiments in this line are of very great scientific interest, but up to the present the practical results from these studies have been of little importance.

It has been repeatedly shown that transplantation of an ovary or piece of ovary after castration will maintain for a time the function of menstruation, while in animals it has been demonstrated that for a time after implantation the follicles continue to ripen as they do in the normally placed ovary. Several cases of impregnation have occurred after implantation of ovarian tissue in the tubal angles of the uterus. Frank (*Zentr. f. Gyn.*, 1898, p. 444) and Halliday-Crom (Edinburgh Obstetrical Soc., 1905) have reported each a case of pregnancy and full-term child after such an operation. In the latter

case the ovary transplanted was from another woman, and the query is raised, who is the mother? A few cases of impregnation followed by abortion have occurred, including one in my own practice.

It was at first supposed when Chrobak announced that the transplanted ovary would continue to live and functionate that in this way a means was provided for the avoidance of the symptoms of the artificial menopause after operations which necessitate the removal of both ovaries. The experience of surgeons in implanting ovarian tissue for this purpose has been disappointing, and corresponds to the results which I have had in my own experiments. Out of about twenty-five cases in whom ovarian tissue was implanted in the leaves of the broad ligament or in the layers of the abdominal wall, following hysterectomy and castration, exact information was gained from twelve. Of these, seven had hot flashes severely, two had them lightly and three had none at all. One of the cases had vicarious menstruation from the nose and rectum, and in two the implanted ovarian tissue became cystic and painful. The practice has been abandoned in my clinic, excepting for purposes of possible impregnation.

#### CASTRATION OF MATURE WOMEN.

The effect of castration on women of sexual maturity is a matter of daily observation among surgeons; nevertheless there exists on this subject the widest divergence of opinion. On the one hand, there are those who regard the extirpation of the ovaries as provocative of the most serious postoperative psychoneuroses, while on the other hand there are many who believe that the removal of the ovarian secretion has an inappreciable influence on the physical welfare of a woman and that in certain neurotic conditions it is actually beneficial. In order to test this point I wrote a number of letters to my patients who had undergone supravaginal hysterectomy with removal of both adnexa. Each patient was asked the following questions:

1. Whether or not she had suffered from hot flashes.
2. Whether she had been more nervous or less nervous since the operation?
3. Whether there had been any change in her sexual feelings.
4. Whether or not she regarded herself improved in health by the operation, and to what extent.

To this set of questions 136 answers were received. The operations represented in this list were all supravaginal hysterectomies, with removal of the ovaries, although in a few of them there had

been an implantation of ovarian tissue. The operations were mostly for fibroids, pelvic inflammation and double ovarian disease.

Of the 136 patients sixty-six had suffered from hot flashes for a few months, forty-two had had them slightly, but were not seriously troubled by them, while twenty-eight had not experienced them at all. In other words, over one-half of them were not seriously troubled by them.

This question was put in order to determine the amount and duration of the symptoms of the artificial menopause on the theory that the presence of hot flashes is the most accurate index of this condition. The general impression gained from these figures was that the artificial menopause from hysterectomy and castration is shorter and less severe than is the natural menopause.

In answer to the question whether the patients were more nervous or less nervous after the operation ninety-six reported that they were *less* nervous than before, while forty reported either that they were just the same as before, or that they were more nervous. If 70 per cent. of castrated patients state that their operation has made them less nervous than they were when they had their ovaries, it does not seem as if the removal of the ovaries could have any great specific tendency to produce psychoneuroses. Of the forty patients who said they were more nervous than before the operation, or that their nerves were the same as before, thirty-three said that their general health had been improved, so that their nervous condition could not be said to be serious. Of the seven patients who said that their general health and nervous condition were both made worse, four were long-standing cases of pelvic inflammation who had had previous conservative operations, and who were markedly neurotic before the operation. The other three cases simply stated that they were more nervous, and that their general health was worse than before operation. In one of them the cause was found to be due to rheumatism, and in another it was due to a postoperative hernia of the wound. These figures would compare favorably with those of any other serious surgical operation, in which unquestionably nearly an equal percentage would report an increased nervousness after the operation. Definite severe psychoneuroses traceable directly to the loss of ovarian secretion have not come under my notice. The real causes for the serious postoperative nervous complications can usually be found in such lesions as postoperative pelvic adhesions, postoperative hernia, incomplete support of the pelvic floor, wound infections and other results of unsuccessful surgical technic, which leave the patient in an uncomfortable or painful state.



It seems to me that in considering this important subject we should divide the artificial menopause symptoms into two distinct groups, the vasomotor and the psychoneurotic.

The vasomotor symptoms are represented in general by the so-called hot flashes, while the psychoneurotic symptoms include those hysterical, neurotic and mental disturbances which are often described as the inevitable and dreadful fate of the castrated woman.

With regard to the first group of symptoms, there is no doubt that the removal of the ovaries causes a distinct vasomotor disturbance which is manifested by hot flashes in at least 80 per cent. of cases.

There is not time to enumerate the many theories which attempt to explain this phenomenon as a result of the removal of the internal secretion of the ovary. They are extremely interesting but not convincing. On the other hand it should be noted that these same symptoms occur with nearly equal frequency when one or both ovaries have been left. Shickele has recently described these symptoms as "Retentionserscheinungen" and admits that they are scarcely to be distinguished from those following removal of both ovaries (Ausfallserscheinungen). They may also appear after conservative operations on the pelvic organs. The worst case of hot flashes that I have ever seen occurred in a woman of twenty-five after the removal of a tube and one ovary for acute salpingitis, while another severe case was a girl of nineteen who had one tube removed for chronic salpingitis, both ovaries and uterus being left.

#### PSYCHONEUROSES.

With regard to the more serious psychoneuroses which are said to follow hysterectomy we have seen by the figures in my series that the number is so small as not to be regarded as a definite consequence of the operation.

The subject has recently been treated in an illuminating way by Prof. Max Walthard. According to Walthard about 80 per cent. of patients who have undergone hysterectomy and partial, or complete, castration exhibit some of the symptoms characteristic of the physiological menopause, the other 20 per cent. being entirely free from them. The age of the patient operated on apparently makes no difference. He agrees with Sarvey, Cemach and Senn that the symptoms are not due to the removal of the internal secretion of the ovary, for these authors have shown convincingly that they occur only about 1 per cent. oftener in patients who have had

both ovaries removed than they do in patients in whom one or both ovaries have been left. Indeed, Cemach found that working women in whom both ovaries had been removed at the operation suffered less, and were better fitted for work, than were those in whom the ovaries had been left. Walthard observed sixty-four myoma cases who, before abdominal hysterectomy, suffered from psychoneurotic symptoms similar to those under discussion, and found that in spite of the removal of the uterus and ovaries these symptoms entirely and permanently disappeared after the operation in a considerable percentage of the cases. He advances the interesting theory that the psychoneuroses are due to a pathological *mental habit*, in individuals with a neurotic tendency entirely independent of direct pelvic reflexes, and that this psychopathy manifests itself by an "overvaluation" of certain symptoms.

In the postoperative cases the improper mental habit may become fixed on certain apprehensions, such as the loss of sexual function, fear of early old age, impossibility of having children, loss of marital affection, etc., whereupon the neurotic symptoms may ensue. Walthard believes that the severe functional nervous disturbances seen in postoperative cases occur only in those individuals who have exhibited before the operation signs of an abnormal irritability of the nervous system, the *cause* of which he ascribes to the pathological mental habit. He believes that the functional neuroses should be discovered and treated psychotherapeutically in those individuals who refer their troubles to the genital apparatus, and that in this way many gynecological operations would be avoided. He assumes that many of the pelvic conditions which now receive surgical treatment are in fact of themselves harmless, and that the suffering of the patient is due solely to the abnormal overvaluation with which she magnifies small symptoms.

My own observations agree with Walthard only in part. It is true that there seems to be no evidence that certain pelvic lesions produce necessary specific neuropathic sequelæ. Exactly the same nervous symptom complex may appear in patients who have pelvic inflammatory disease, or chronic appendicitis, or pericolitis, or cholecystitis, or enteroptosis, or postoperative adhesions, or numerous other conditions, excepting that the abnormal mental vision may be chiefly concentrated on different points of the body. On the other hand, every one of these pathological conditions may exist even to a marked degree without the slightest physical or mental symptom. The same statement may be made of the minor pelvic lesions, namely, small tumors, malpositions, relaxation of the pelvic supports, etc.

Although all these conditions are essentially pathological, they do not become clinically important from the neuropathic standpoint unless they produce *pain*. It is *pain*, even though slight, which causes the abnormal irritability of the nervous symptoms, if it be constant and nagging. In an individual who by inheritance has a special tendency toward functional neuroses the effect of constant nagging discomfort will be much greater than in one whose nervous equilibrium is congenitally stable. The fact that local pain and discomfort constitute the chief factor in the production of genital psychoneuroses is repeatedly proved by cases in which the nervous disturbances instantly disappear after proper surgical treatment of the local affection.

If it be admitted that the genital neuroses are due to actual local defects which cause pelvic pain or discomfort, some one asks why it is that these neuroses sometimes persist or grow worse, or even make their first appearance after surgical operations, especially that of hysterectomy. The answer is that either the operation was not directed to the real underlying cause of the trouble or else that the operation was done in such a way that painful and discomforting lesions result from the operation itself. The first alternative needs no comment, but the second is one of great importance. No one familiar with surgical cases will deny that postoperative neuroses are less common and less severe than they were fifteen years ago. The only explanation of this is that the improvement is due to better surgical technic. A hysterectomy operation which has left a sagging cervical stump or vagina, or an imperfect peritonization of the pelvic floor, or vessels oozing into the leaves of the broad ligaments, or other relics of improper technic, will almost surely be followed by nagging discomforts that will threaten the stability of the nervous system. In accord with this idea is Connell (*Surg., Gyn. and Obst.*, 1912) who states that the postoperative nervous condition of his hysterectomy patients has progressively improved concomitantly with his own experience and improvement in operative technic.

#### SEXUAL SENSIBILITY.

The effect of castration on the sexual sensibility of a woman is a matter often of much importance and a subject about which it is difficult to get accurate information. The data gathered from the answers to the third question in the letter are valuable as giving a general idea of how this function is influenced by hysterectomy, but of course the figures lack scientific accuracy. Only 101 of the 136

answered the question as to the change in their sexual feelings. Out of the 101 who answered seventy-two said there was no change, five said that desire and sensation were stronger, eighteen said that the feeling was diminished, and six simply said it was changed, probably meaning diminished. We may conclude from this inquiry that in some cases there is a diminution and even complete disappearance of sexual sensibility after castration of mature women. The figures here collected show a diminution in about 20 per cent. It is probable that the number is even smaller than this, for it is not unlikely that some of this number were frigid before operation. Some of those in whom the sensation had decreased, or disappeared, complained that coitus had been painful since the operation, so that it is probable that the cause was purely local and not due to any inherent change in the nerve reflexes. Several of those who reported that the sensation was stronger said that it was because coitus had ceased to be painful since the operation. Unquestionably, therefore, local pain plays a considerable part in the cases of diminished sensibility.

#### ORGANOTHERAPY.

In reviewing our inquiries up to the present point it may be said that aside from the obvious influence which the ovaries exert over menstruation and fetation, the chief evidence of an ovarian secretion that may affect the general organism is shown by the vasomotor disturbances (hot flashes) which appear so frequently after castration of mature women, and by the atrophy of the external genitals, which usually takes place after the same operation. This evidence is very strongly substantiated by the clinical results of the administration of ovarian extract. The beneficial effect of the extract on the hot flashes of the artificial and physiological menopause is no longer a matter of speculation but an established fact. In my own practice I use the extract as a routine after hysterectomies if hot flashes appear and find that with occasional exceptions it gives marked relief.

That ovarian extract has a selective action on the external genitals has been shown by experimentation. Schickele and others produced in castrated bitches a local hyperemia of external genitals similar to that of rut by the administration of extracts of ovary and corpus luteum. The same condition was produced in normal bitches when not in a state of heat. Schickele as a result of these experiments treated with these extracts a woman who was suffering from pruritus and kraurosis vulvæ which had resulted from atrophy of the external genitals following a double ovariectomy. He reports a complete

cure of this case. Acting on the suggestion of this report I have treated a similar case with the following result.

A woman of fifty-eight, seen first in October, 1912, was suffering from an early kraurosis vulvæ. The symptoms which dated back two years followed an extensive perineal operation. When first examined the external genitals showed a marked atrophy and shrinking. The labia majora were dry and cracked and mottled with white scaly patches. There were numerous evidences of pruritus and scratching. The patient suffered intensely and was in the desperate mental state characteristic of this condition. Local applications had proved of little value. Acting on the suggestion of Schickele I gave her ovarian extract in large doses. Relief was almost immediate and at the end of a month was complete. The condition of the vulva has undergone a marked change. The white kraurotic appearance has disappeared and the tissue has become soft and flexible. Itching and discomfort have entirely disappeared. The patient is kept on ovarian extract with occasional ten-day remissions.

Encouraged by the results of ovarian organotherapy in treating menopause symptoms, I am using the extract experimentally in numerous conditions including amenorrhea, dysmenorrhea, oligomenorrhea, infantilism, sterility, ovarian deficiency (as described by Burnham), lactation atrophy, atrophy of the menopause and even in the menorrhagia of uterine insufficiency. It must be admitted that my results in treating these other conditions have not been particularly encouraging, many of them have been completely disappointing. Nevertheless I am convinced that when the problems of extraction, dosage, etc., are better worked out ovarian medication will become a valuable asset in certain lines of gynecological treatment.

#### CONCLUSIONS.

From the present status of our knowledge concerning the physiology of the ovary we seem justified in drawing the following conclusions:

1. Anatomical evidence makes it probable but not incontestable that the ovary is an organ of internal secretion.
2. Infantilism is not a result of ovarian deficiency but is a local or general manifestation of a hypoplastic constitution in which the ovary may or may not share incidentally.
3. After sexual maturity the ovary exercises a trophic influence over the other internal and external genital organs.

4. There is evidence to show that the ovaries preside over menstruation by an internal secretion which has a selective action on the endometrium; and that abnormal uterine bleeding may be due to a hypersecretion of the ovaries. This evidence is not incontestable.

5. Transplantation of ovarian tissue has not as yet proved to be of great practical value in the surgical treatment of gynecological patients.

6. Castration of sexually mature women directly causes vasomotor symptoms typified by hot flashes in 80 per cent. of cases.

7. Definite psychoneuroses are *not directly caused by castration*, but such symptoms if present are due to other causes that produce physical or mental pain or discomfort.

8. Ovarian extract is invaluable in the treatment of the vasomotor disturbances following castration. Its value in the treatment of other gynecological conditions is problematical.

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## INTESTINAL OBSTRUCTION.

BY

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It is not my purpose to advocate anything new upon the subject of intestinal obstruction. This paper is intended more as a review of the recent work on this subject. In past years this condition had a mortality ranging from 50 to 70 per cent., but recently is showing better results due to the fact that the cases are referred earlier to the surgeon and that they are profiting by the experimental and clinical work that has been done on this subject.

The principal factors which have brought about a reduction of mortality are, first, the early diagnosis and operation; second, the drainage of the intestine in cases showing toxemia. That toxemia is the cause of death in these cases is held by practically all the recent investigators. Hartwell and Hogue have recently been able to keep a number of dogs alive and in good condition for three weeks, after applying a clamp in such a way as to cause simple obstruction of the lower duodenum, by giving salt solution in excess of the measured daily output of fluids. They conclude that the important element, in the development of symptoms seen in simple intestinal obstruction in dogs, is the loss of fluids due to vomiting. Symptoms of intoxication, resulting from tissue disintegration, follow this loss.

They emphasize particularly the fact that the results held good



only when the obstruction was uncomplicated by any serious disturbance to the circulation through the intestinal wall. These same observers, in a previous series of experiments had excluded the invasion of the blood and organs by bacteria as a cause of death and have further shown that food residues in the stomach and intestine played no part in bringing about the animal's death.

J. W. Draper proved in a series of experiments that obstruction high in the intestinal tract produced death more rapidly than obstruction lower down.

Stone, Whipple and Bernheim conducted a series of experiments in which they placed two ligatures on the duodenum a few centimeters apart. They found these dogs would die in from twenty-four to seventy-two hours. If this portion of the duodenum was opened and drained the dog could be kept alive from six to eight weeks. If they occluded the drainage the dog would immediately develop toxic symptoms.

They conclude from this that the loop contained some highly toxic material. They further call attention to the investigations of Halstead and others in which they isolated, by means of ligatures, loops of the low ileum with a survival of the dogs for several weeks.

These facts bear out the work of Draper that the toxemia is greater when the obstruction is high. In concluding they make the following statement: "Our experiments have shown the importance of thorough and early drainage especially in high obstruction. The suggestion also arises that in these cases of obstruction where the surgeon is in doubt whether to close the abdomen or establish intestinal drainage (and perhaps no problem requires nicer surgical judgment), a border-line case when situated low in the gut might be safely closed and should be drained if placed in the upper loops. This in spite of the well-known risks of skin digestion and starvation with high enterostomies. The danger of rapid toxic death is a more pressing consideration than either of these objections."

Murphy and Vincent conducted a series of experiments on cats in which they interfered with the circulation of the obstructed intestine. Their conclusions were in part: First, interference with the circulation of obstructed intestine is the vital factor in the production of the typical symptoms of acute ileus. The obstruction of the venous return is the most important element in this circulatory disturbance. Second, the acute symptoms are caused by the absorption of a toxic substance which is found in the obstructed intestine.

If we were able to operate upon all cases of intestinal obstruction

within a few hours of the time the obstruction occurred the death rate would be remarkably small. If taken early the patient is in good condition to withstand the anesthetic and operation, the intestine, which through hours of procrastination may become gangrenous, will be in a condition to resume its normal function and the long convalescence of intestinal drainage and secondary operation may be avoided.

In the differentiation of the various forms of ileus, we occasionally encounter difficulty. Abdominal pain, inability to secure bowel movements, vomiting and tympanites may be present in the adynamic and dynamic forms as well as in the mechanical obstruction. A careful consideration of the history of the case together with the physical examination will usually clear the diagnosis.

In the adynamic form the symptoms may follow injury to the spinal cord, injuries around the genital region or buttocks or injuries to the mediastinum. The symptoms may come on following gallstone or renal colic or may be the result of a strangulation of a piece of the omentum.

The paralysis may follow abdominal operation, especially if there has been considerable trauma to the intestine or its mesentery. It is often seen following the return of a piece of intestine which has been strangulated in a hernial opening. A paralysis will occasionally develop from peritonitis or as a result of inflammation of the appendix, Fallopian tubes or bile passages.

One of the most important points to bear in mind is the fact that we have a pronounced borborygmus with the mechanical obstruction, while in the adynamic ileus this is absent. The dynamic form of the ileus is due to a tonic contraction of the circular muscular fibers of the bowel. This is brought on from some form of poisoning, either from toxic products of food or mineral poisons. The most common of the latter is that which follows lead poisoning.

That symptoms resembling mechanical obstruction may arise from acute pancreatic fat necrosis and acute hemorrhagic pancreatitis must be borne in mind. Tabetic crises and uremic ileus will occasionally give symptoms resembling mechanical obstruction.

I believe cases of simple intestinal obstruction, without damage to the circulation in the bowel wall, can be closed without great danger from toxemia. This has been shown by the experiments of Hartwell and Hoguet as well as being borne out clinically.

Two such cases have come under my observation recently. In the first case the patient developed symptoms of obstruction two weeks after an operation for abscess of the appendix by Dr. Downing

of Vallejo. He recognized the symptoms early, and, when I saw the patient, she was still in good condition. We operated immediately, finding the lower ileum obstructed by adhesions. These were relieved and the bowel returned without drainage; the patient made an uninterrupted recovery.

In the second case, a hysterectomy had been done for double pyosalphynx with numerous adhesions. Three weeks following the operation the patient developed symptoms of intestinal obstruction. On reopening the abdomen an obstruction was found due to adhesions of the lower ileum. These were relieved, the bowel returned without drainage, and the patient made a good recovery.

At times we do not see these cases until they are desperately sick. They will permit of only a short operation. Where it is possible, the point of obstruction should be located and the bowel, if gangrenous, should be resected. The ends of the intestine should be brought out through the abdominal wound and drained. When the patient's condition has improved an anastomosis can be made.

If the condition is so desperate that it is deemed unwise to proceed to the point of locating the obstruction, the distended intestine can be brought up and drained. This can be done in a few minutes and will undoubtedly tide over many cases until they are in a condition for further surgical procedure.

In concluding let me emphasize the importance of early diagnosis. In a patient who presents symptoms of vomiting and abdominal cramping the question of intestinal obstruction should always be prominent in our mind. The history of the case should be thoroughly considered and a careful physical examination made. After this has been done, if the evidence points toward obstruction, the abdomen should be opened immediately. The fear of opening an abdomen unnecessarily has caused many to disregard the early manifestation and wait for more positive signs. This, perhaps more than anything else, has been responsible for the high death rate of the past. In this condition, more than in any other, a few hours waiting ruins the chances of life-saving surgical methods.

## TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRI- CIANS AND GYNECOLOGISTS.

### EXTRAUTERINE PREGNANCY. OPERATION THREE MONTHS AFTER TERM. RECOVERY.<sup>1</sup>

BY  
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THE terminology of the subject indicated by the title of my paper is not altogether satisfactory. The terms "extrauterine pregnancy," "tubal pregnancy" and "ectopic gestation" are frequently used interchangeably and synonymously, in apparent forgetfulness of the fact that a pregnancy may be extrauterine without being tubal, and tubal without being extrauterine; not to mention the comparatively rare instances of anomalies in the development of the pelvic organs, in the presence of which conception now and then occurs, and to which none of the designations referred to could be properly applied.

Up to 1883, when Lawson Tait first operated for ruptured tubal pregnancy, the condition was chiefly interesting as a post-mortem study and from a pathologic point of view, but since that time it has attained the proportions of an eminent and urgent practical problem. An incalculable amount of investigation has been and is still being conducted in the effort to elaborate methods for its early recognition and to establish something like a uniform and satisfactory basis for its treatment. Moreover, it was in former times generally regarded as one of the rarest affections, so rare indeed that it was said that those in charge of large maternities might never see a case. In Hart and Barbour's *Manual of Gynecology* (1883) Bandl is quoted as saying, that out of 60,000 gynecological and obstetrical cases received in seven years at two large clinics in Vienna, there were but five cases of extrauterine gestation.

At the present day, the condition is far more frequently encountered than such statements would indicate. For instance, Dr. Charles P. Noble, a native of this State, who is now in charge

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

of the Kensington Hospital for Women in Philadelphia, says that from 3 to 4 per cent. of all his laparotomies are performed for it and Dr. Howard A. Kelly's experience is practically the same.

The vastly increased frequency in the incidence of abnormal pregnancies is, however, in some degree misleading, because there can be no doubt that the comparatively crude methods of diagnosis and the infrequency with which the peritoneal cavity was opened three decades ago, permitted many cases to escape recognition. Notwithstanding this fact, it is more than likely that there is in reality a greater prevalence of this condition, and for several reasons, not the least of which is the unfortunate moral and physical degeneration, particularly among the poor in large centers of population.

In the attempt to explain the etiology of extrauterine gestation, many ingenious assumptions and theories have been advanced, all of them bearing a greater or less degree of apparent plausibility. Knowing the function of the Fallopian tubes and the generally accepted dicta as to the mechanism of their action, it is easy to conceive of numerous and various conditions which in the abstract should offer an impassable mechanical barrier to the passage of the ovum from its place of origin to the uterus. Accordingly, one of the oldest theories was based upon the real or fancied effect of peritoneal adhesions which, by compressing the lumen of the tube or by interfering with its normal peristaltic action, would arrest the ovum at some point in its journey. In the same way, the coincidence of intra- and extratubal tumors with the pregnant tube has added these growths to the category of probable mechanical causes. I need only mention in this connection the occasional citation of congenital stenosis, puerperal atrophy and persistence of the fetal type of tube, each of which conditions has been brought forward in an etiologic rôle. The existence of an antecedent salpingitis in so large a number of cases of tubal pregnancy has undoubtedly furnished the most interesting, engaging and attractive argument concerning the way in which it is produced. Up to recent times, it has been almost universally believed that fertilization of the ovum normally took place in the uterine cavity because of the disposition and action of the ciliated cells of the uterine and tubal mucosa, the former producing a current that was directed upward in the uterus and the latter a current that was directed downward in the tubes. On account of this arrangement, the spermatozoa could easily reach the fundus of the uterus, but could go no further by

reason of the opposing action of the tubal cilia. Therefore, if the cilia of the tube had been incapacitated or destroyed in consequence of an attack of endosalpingitis, this obstacle would be removed while the normal downward propulsion of the ovum would be made difficult or impossible. What a beautiful theory, and yet how fallacious are the arguments which are based upon it! For instance, it has been satisfactorily shown that the ciliary current is continuous and unbroken from the fimbria of the tubes to the internal os and that, therefore, the upward movement of the spermatozoa is "opposed" from the time of their entrance into the uterus. Moreover, animal experimentation as well as observations upon human beings have established the fact that spermatozoa are present in the ampulla of the tubes a few hours after sexual intercourse. Hence, we must abandon the old teaching, notwithstanding the attractive guise in which it appealed to us, and accept, as a demonstrable fact, the statement that normal conception occurs in the place which I have mentioned or even upon the surface of the ovary. Every pregnancy, then, is primarily extrauterine, and in the future we shall not have to ransack our intellectual resources in search of an acceptable explanation for the occasional "fortuitous" or "accidental" meeting of ova and spermatozoa in the Fallopian tube, but shall be confronted with the manifestly more difficult problem of determining why the fecundated ovum ever develops in any other place. Still further evidence of the untenability of the old theory of Tait has been furnished by careful and competent observers as a result of microscopic study of pregnant tubes. Dr. J Whitridge Williams tells us that in nearly every specimen examined by him he was able to demonstrate the presence of cilia.

Notwithstanding the explosion of this old explanatory hypothesis, the fact remains that there is some etiologic relation between salpingitis and extrauterine gestation, for in the great majority of cases there is a history of previous pelvic inflammation which is repeatedly confirmed by the histologic study of specimens removed at operation. Just what this relation is, has not been satisfactorily determined, so that the net result of all the speculation and study concerning ectopic pregnancy is that we do not know its cause.

Of similarly striking interest is the great change in the attitude of the profession as to the results or terminations of tubal pregnancies. It was formerly believed that their universal fate was



rupture, either into the peritoneal cavity or between the folds of the broad ligament. It is now known that the great majority terminate in the early part of the pregnancy by abortion through the abdominal ostium of the tube, while in rare instances, neither rupture nor abortion takes place but the case goes on to full development. It seems, indeed, that abortion is the natural and almost inevitable result of the ordinary ampullar pregnancy, while in the less common isthmic variety, where the tubal lumen is so small, rupture is far more likely to occur. In my case, I feel sure that the ovum had been implanted in the outer portion of the tube and that abortion would certainly have taken place if the abdominal ostium had been permeable. What did occur, was rupture with escape of the fetus into the peritoneal cavity, the placenta retaining its attachment to the tuboovarian sac, thus permitting fetal development to reach full term.

The fate of the embryo or fetus in ruptured and unruptured cases is of great interest as well as practical importance. There can be no doubt that small embryos, when expelled into the peritoneal cavity, are promptly absorbed, unless the placenta retains a firm attachment to the tube. It is equally certain that they are sometimes absorbed while still within the tube. These facts have been repeatedly demonstrated by the examination of specimens obtained at operation. After the third month, however, absorption does not take place, and we must note the changes which it is likely to undergo, whether still in the gestation sac or lying free in the abdominal cavity. These changes are usually designated as mummification, calcification and suppuration. The mummified fetus is one in which the fluid portions and internal organs have been absorbed, leaving the skeleton, whose bones are held together by the shriveled skin. In calcification, as the name implies, there is a deposit of calcareous material in the fetus or its membranes, giving rise to the so-called "stone fetus" or lithopedion. Suppuration occurs in all forms of abnormal pregnancy in which the dead fetus remains within the mother, but is particularly liable to ensue in the extraperitoneal or broad ligament form, on account of the close proximity of the rectum and the consequent easy access of intestinal bacteria. Lithopedion formation is regarded as the most favorable of these changes, since the calcified fetus may be carried for many years as an innocuous foreign body, causing no difficulty except a possible mechanical interference with the progress of subsequent labors. One of the most remarkable cases of this

kind was that of the seventy-four-years-old woman, who had carried a stone fetus within her for forty-eight years and from whom the specimen was obtained at Leinzell in 1720. In the meantime she had given birth to several children.

I need not remind this audience that the diagnosis of early unruptured cases of tubal gestation is, in the vast majority of instances, impracticable if not impossible. Theoretically, one would say that the discovery of a unilateral tubal tumor in a patient presenting the ordinary subjective symptoms and physical signs of early pregnancy, especially if she has been sterile for several years, should be sufficient; but operative experience has taught us that diagnoses based upon these criteria are usually incorrect. Moreover, it is to be borne in mind that there is nothing distinctive or peculiar in the symptomatology of the early cases, so that there is no reason why the patient should consult a physician and thus give him an opportunity to make an examination. Therefore, both patient and physician are entirely ignorant of the existence of any extraordinary condition until suddenly disillusioned by the symptoms which indicate that rupture or abortion has taken place. Indeed, in many instances, the patient herself does not believe that she is pregnant, and numerous cases have been reported in which fatal rupture occurred before a menstrual period had been missed. Striking emphasis has thus been laid upon the fact that suppression of the menses does not regularly occur in extrauterine gestation and is of little value as the basis for a diagnosis. To this observation additional interest is attached when we reflect that if the fetus dies at an early period there is commonly a greater or less amount of uterine hemorrhage which is readily mistaken for the menstrual flow or an early abortion, the presence of shreds of uterine decidua making the mimicry of the latter condition apparently complete. As a matter of fact, in ordinary experience, the first indication of the existence of an abnormal pregnancy is the sudden onset of sharp pain in the iliac region, followed by marked pallor and faintness of the patient, who passes into a condition of collapse and frequently presents a subnormal temperature. Such events indicate rupture of the tube with the escape of blood into the peritoneal cavity, or, if the symptoms of collapse are not so pronounced, a tubal abortion has probably taken place and the blood is trickling through the Fallopian tube. If the patient does not die from the effects of rupture and hemorrhage, and the placenta has not been separated from its attachment, a secondary

abnormal pregnancy follows and the fetus continues to develop. The usual symptoms of pregnancy will persist, but the patient will suffer a great deal more pain and, as might naturally be supposed, will feel the fetal movements more acutely than in normal pregnancy. The pain is undoubtedly due to the distention and contractions of the fetal sac and also to the stretching of adhesions which form between it and the adjacent organs. In abdominal pregnancies, thus brought about, spurious labor sets in at term, accompanied by distinct contractions, which apparently take place in the uterus itself, although a certain amount of pain is probably due to definite contractions of the fetal sac. This false labor lasts for an indefinite time—it may be hours or days—and the death of the fetus soon follows, after which the placental circulation gradually ceases and the amniotic fluid is absorbed, leaving the abdomen distinctly smaller.

The recognition of advanced extrauterine pregnancies is usually made after full term has been reached and is based upon the sequence of events referred to, which, when taken with the results of a physical examination, make a characteristic picture, that leaves no room for doubt.

Enlightened medical opinion is practically unanimous in regard to the treatment of unruptured extrauterine pregnancy, and the propriety and importance of immediate operation is universally recognized. Unfortunately, however, our diagnostic art has not yet become so refined as to place a problem before us so easy of solution, except in very rare instances, since the diagnosis is not and cannot be made until rupture or abortion has occurred. In the year of my graduation (1883), Lawson Tait is said to have been the first to do a laparotomy for the rupture of a pregnant tube, and the surprising ease with which he executed it and the equally surprising results which followed, caused all gynecologic surgeons to follow his example, and the record of thousands of lives which have been saved by this procedure constitutes one of the brightest chapters in the history of surgery. The treatment of ectopic pregnancy of less than four months' duration may be thus dismissed.

In the later months, the treatment depends somewhat upon the condition and location of the fetus. It may be living and enclosed in a tubal or ovarian sac, or it may be situated between the folds of the broad ligament; but ordinarily we have to deal with cases similar to mine—secondary abdominal pregnancies—the fetus and its membranes being in the peritoneal cavity, and

the placenta either within the tube or broadly implanted upon its outer portion and the pelvic floor. In any case, advanced ectopic pregnancies with a living child are always a serious menace to the pregnant woman, chiefly on account of the great danger of sudden hemorrhage, so that real conservatism in such cases lies in prompt surgical intervention. Such intervention usually implies the removal of the entire fetal sac, which in the relatively infrequent cases of unruptured tubal or ovarian pregnancies may be a simple and safe procedure. Unluckily, the fetal sac may be extensively and firmly adherent to adjacent organs and still more unfortunately the placental attachment may cover a broad area. In the extraperitoneal pregnancies, where the growing ovum spreads apart the folds of the broad ligament, the difficulties of successful enucleation increase with time, and in many instances the uterus must be removed along with the fetal sac by methods similar to those in use for intra-ligamentous fibroid tumors. There can be no doubt that abdominal section for these cases, taken as a group, is the most dangerous of operative procedures, despite the fact that improvements in technic have made it less dreaded now than it was in former times.

On the contrary, when the child is dead, the chief danger—that of hemorrhage from the placental site—rapidly disappears, and, after about six weeks, no anxiety need be felt as to hemorrhage from that source. However, to defer operation for too long a period is to invite the dangers of infection of the fetal sac from the intestines. As is shown from the history of the case which I am about to read, operation was performed about three months after false labor with the happiest results. The record is as follows:

Mrs H. A., age thirty-four, of Somerset County, Maryland, was admitted to the Hospital, October 21, 1911, and operated upon the same day. She has been married seven years and had one child five years old. Delivery was spontaneous and puerperium uncomplicated. Her last menstrual period was in October, 1910. She claims to have first noticed fetal movements the following February and these movements continued until June. Early in July, according to her physician, spurious labor pains came on and the cervix was somewhat dilated. These pains, however, subsided in a few hours and she has been comparatively comfortable ever since, having attended and taken an active part in a "picnic" during the week of her arrival in Baltimore. Since the false labor referred to, her abdominal swelling has noticeably subsided. In the earlier

part of her pregnancy she bled slightly on several occasions and at irregular intervals. Has not been sick during the past year, except in July, as stated.

Examination without anesthesia disclosed a rather firm and elongated cervix crowded forward toward the pubic arch. With the vaginal finger in the posterior fornix, a large, boggy, and semielastic mass, extending well back in the sacral hollow, could be easily made out. This mass seemed intimately connected with the cervix, while from its lower anterior surface projected a mass corresponding in shape and size to the unimpregnated uterus. Colostrum could be expressed from the nipples. Under anesthesia, the above findings were confirmed and, in addition, a firm, irregular, freely movable mass could be felt in the epigastric region, suggestive of a pediculated, subperitoneal fibroid. More careful examination, however, seemed to indicate the shape and symmetry of fetal limbs. At operation, an incision 7 inches long was made, extending 1 1/2 inches above the umbilicus. The first thing noticed on opening the peritoneal cavity was the presence of free fluid. On retracting the edges of the incision, the knee of the fetus was observed projecting toward its upper angle. Its size, shape and location suggested for an instant a displaced and distended gall-bladder, but on grasping it and pulling gently, the real condition was quickly recognized. The fetus was extracted, breech first, and some force was necessary to dislodge the head from the under border of the liver. Here it had evidently lain for a considerable time, for it was distinctly flattened, presumably by the respiratory movements forcing the liver down upon it. Its buttocks, back and shoulders were snugly covered by the omentum, which, for the most part, could be easily stripped off, but which was tied and cut in several places. It was apparently enveloped by the closely adherent amniotic sac. The umbilical cord was ligated and cut and its placental end was traced directly through ovarian tissue, which, with the enormously dilated outer portion of the Fallopian tube, made up the sac containing the placenta. All the ovarian substance was thus disposed, since no portion could be found elsewhere. The sac, as large as a child's head, was tightly distended and found to contain the placenta and coagulated blood. It lay immediately behind the uterus to which it was firmly adherent, as well as to the rectum and the small intestines. The ovarian ligament led directly into the sac wall. The appendix was also glued to its posterior surface and was removed. In trying to detach the sac and save the uterus, the latter organ was torn and considerable hemorrhage resulted. This fact, and the unfavorable conditions for reuniting and suturing the uterine rent, led me to decide upon the removal of that organ. On the right side of the pelvis there was a hydrosalpinx as large or larger than my thumb. A drain was inserted in the lower angle of the incision and the patient made an uneventful and satisfactory recovery.

THE PROS AND CONS OF SPECIALISM.<sup>1</sup>

BY

DOUGLAS C. MORIARTA, M. D.,

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THE following note appears as a preface to the annual report of the proceedings of our society: "The association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume." That a necessity for such a statement exists should be a source of chagrin to every member of this body. Particularly is this so if we recall how often in our discussions we refer to the general practitioner with a rising inflection, or with positive disparagement if the referred case happens to have become complicated because of the lack of appreciation of early symptoms.

Specialists invariably consider it imperative that the family physician should be familiar with the symptoms in obscure cases, read them correctly and act accordingly; in fact, as specialists we suggest that the general practitioner should know everything concerning a referred case except how to treat it, though we do little or nothing to inform or help him by our teachings.

I would preface what I shall say by stating that in favor of specialism there is everything good to be said, and against it there is absolutely nothing. And, further, it should be understood that any remarks I may make do not apply to the scientific man who is doing research work, who often gives up the best part, if not all, of his life with little thought of monetary remuneration.

Specialism has become a necessity with the great American people; they demand the best skill obtainable. Unfortunately, their judgment is often at fault, which results frequently in a censure for specialism. This is well illustrated by the universal opinion of the medico-legal expert. People generally believe that their number, and the side they take, is only governed by the fee. This is an unfortunate view of our profession. The trouble is not with specialism, but with the specialist.

It is not intended to suggest, however, that the field of specialism is in any way narrowed by the action of any particular specialist.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



Specialists fall into two classes: First, those men who are naturally great, and are specialists because they cannot help it. They would be great in any line. They are exceptional in their work, and are specialists because their colleagues, great and small, demand their services in anxious cases. Second is the class of men of average ability or less, who are specialists because they say they are. They are clever enough to recognize that the field of specialism is lucrative. It is quite usual for these individuals to go abroad for a few months, and on their return declare themselves specialists, sending out cards announcing their self-declared ability to the general practitioners in their locality. At the first opportunity they seek to impress the general practitioner with the seriousness of his attempting to care for cases which may come to him in their particular line of work.

So much for the etiology of the specialist; the habitat of the first class is only here and there; that of the latter is everywhere.

My judgment is that if a standard were established and a special degree required by state enactment, it would prove a benefit to the specialist, the general practitioner and the public. The public assumes that the specialist is superior in qualifications to the general practitioner, when, as a matter of fact, he is practising under the same degree and authority, and need not necessarily be more competent; though because he assumes and announces himself a specialist, he is permitted to exact a fee many times larger than the general practitioner. Further, if a standard were established, the specialist would really be on a higher plane as he should be, for in many instances commercialism seems to be the objective point rather than scientific attainment. Years ago it was essential for one to be in general practice before taking up special work; now, however, it seems to be from the cradle to the specialist.

Standardizing specialism would largely eliminate incompetent men; it would relieve and stimulate the scientific research men; it would protect the general practitioner, and would put in their proper place those men who make the fee their chief consideration.

Specialists believe it quite proper for them to watch and wait for the development of symptoms in atypical cases; but they do not concede this privilege to the family physician. Is it because they fear, if the privilege were granted to the general practitioner, that it might deplete their clientèle? Or because they fear that with a little knowledge the general practitioner

might be a menace to the public through not recognizing his limitations? If the latter view is held, it is unworthy of them, for the general practitioner in isolated districts is often a hero and is forced to exhibit skill, genius and judgment that would put many a specialist to shame. We should remember that the general practitioner is obliged to meet cases under all conditions; many times he must act quite alone; he is beyond the reach of a consultant of any type, much less a specialist; and it should be our endeavor to assist him in every way possible by our scientific work. How could we do it better than by making our proceedings an authority which he could follow, with the certainty of knowing that at least he is up to date in his work?

In a little book entitled "Being Done Good," the author describes a man afflicted with rheumatism who goes from one specialist to another, from one resort to another, and tries all kinds of treatment without betterment; and in the end the patient is made to say that "undoubtedly there is a great deal of knowledge marketed by the medical profession before it is ripe," and in this I concur.

How well does the specialist do his work? I hesitate to judge. One class, as you will admit, has called forth a great deal of discussion; I refer to the young surgeon who attacks all regions, regardless of his experience, with apparently little realization of his limitations. He has not learned that the price of surgical skill is human life, and that nature exactingly demands her toll.

Worse than these men, however, in my judgment, is the great surgeon who removes a growth in a spectacular manner in the shortest possible time, after which the patient is wheeled over into a corner of the room where his assistant works indefinitely to repair the trauma inflicted in a few moments by the specialist. Thank God, gentlemen, it is becoming the custom for the man who opens a belly to close it.

A few personal experiences may serve to emphasize how specialists, both authors and teachers, occasionally conduct their work.

At a recent state medical meeting, the President of the society, an eminent gynecologist, reported a case of panhysterectomy; it was an elective case. It came out in the discussion that the patient had the grippè, with pulmonary manifestations, at the time of the operation. I asked the operator if he advised giving an anesthetic in such conditions; he promptly replied "No" he did not, but stated further that if he had not operated some-

one else would, as the patient was anxious for the operation, and he could not afford to take the chance of losing the fee.

I had a case of epithelioma of the lip, and I advised excision of the growth as the proper treatment. The patient rather objected to the knife, and wanted caustic paste used. I advised him that that was not the best thing to do and persuaded him to consult one of my old teachers. Instead of standing for his teachings, however, the consultant promptly acquiesced to the patient's request, entirely disregarding my suggestions, and used the caustic paste instead of the knife. And when the patient was leaving, the astute consultant and specialist said "Let me see you again, my good man, in about a week." The result was of course that I lost a patient and a fee, besides having my judgment discredited.

Some time ago while in New York at one of the very large clinics, I saw an operator do an appendectomy. He simply ligated the appendix and dropped it back into the cavity, closing the incision. I inquired if that were the usual procedure, and was informed that it was. I then asked the number of fecal fistula resulting from this method, and was told it was about 2 per cent. In reply to the query "What excuse do you make to yourself for this result," the operator said "We are so busy, and have so much of this work to do, that we cannot take the time to fuss as many do with these cases." Here was a great man, exposing the patient to possible danger, and why? Admittedly because he would not give the proper time to this work, and yet he was unwilling to divide his services with another. And so I conclude it will go in his field indefinitely, for specialists seldom die and never resign.

Very recently I sent a specimen to the laboratory that its character might be determined. I was told that the patient had a malignant condition from which he could not recover. I did not concur because of the clinical history, and wrote the laboratory to that effect. They then modified their report, saying that while they believed it was a cancerous growth, it might not be; that growths from the bladder were often benign, and I had better watch the condition for a while before telling the patient.

When the drop method of administering ether was becoming appreciated it was most interesting to watch this procedure in our very best clinics. Gentlemen, the imitation was so bad, it was a joke; yet the operator talked in favor of the drop method,

- and supposed his anesthetist was using the drop method, when in reality he was *pouring* the ether on the mask.

Not long ago a young man, a professor and author, was invited to read before our county society. The subject designated was "The proper care of the more common diseases of the eye." Do you suppose he directed us how or when to use ice, dry or wet heat, leeches, or mydriatics, or how to treat a single simple disease of the eye? If you do imagine so, he did not; though he did tell us that there was a very serious condition called glaucoma, in which atropine was very injurious. But instead of telling us how to detect intraocular pressure and the value of eserine in this condition, he concluded his paper by stating that it was very difficult for the general practitioner to differentiate diseases of the eye, and, to be perfectly safe, the sooner we had our eye cases in the hands of a specialist the better it would be for the patient.

Very recently I sent a man to a noted rectal specialist in New York for an operation. His good wife accompanied him. In the course of the visit she inadvertently said that she had chronic appendicitis, and that Dr. Moriarta was going to operate when she returned home. The accomplished specialist knew his business better than he did regional anatomy; he apparently concluded that the rectal region extended to the appendix, for he succeeded in persuading her to allow him to remove hers.

About the same time I sent another patient to a specialist. I was in doubt concerning some cecum symptoms, as to whether they demanded surgery or not. The consultant was an eminent neurologist, a teacher and author. He also was in doubt and called in his surgeon to help diagnose the case, and my patient returned to me minus her appendix. I did not so much mind the appendix being gone, but I was sore about losing the fee. Suppose my methods, as a general surgeon in a small country village, were along such lines as these, what do you think would be the outcome? I will tell you; I would either be out of business or in jail.

In closing I will say I do not ever expect to *see* specialism standardized. But I would bespeak for the family physician the consideration of all organized bodies of specialists, to the extent that they make their proceedings authoritative and so useful. This could best be done in my opinion by extracting, condensing and presenting them in such a way that the views and conclusions on the scientific subjects treated might be

readily available. Such information would be of far greater value than most of you think. This would of course take a great deal of time and cost money; but it would be an added reason for our existence as a society. If economy need to be considered, let each author adstract his own paper, formulate his points or conclusions, and submit them to a committee from the society for approval, before it could become a part of the yearly report.

I would like very much to see this done, for we could then eliminate the very objectionable note, whose appearance as a preface to our reports called forth this paper. If one or both of these objects is ever gained, I shall not regret having taken up your time to-day.

#### 'THE ALPHA AND OMEGA OF THE DIGESTIVE TRACT IN THE NEW-BORN CHILD.'<sup>1</sup>

BY

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New York.

ACCORDING to my first intention, a scientific paper was written embodying studies of the mouth and anus of the new-born child. When completed it became merely a mass of measurements, statistics, opinions and unwieldy facts. It would not do at all. The whole might interest an embryologist, a pediatricist or a dentist, but the obstetrician would be compelled to dig for and apply his findings. Consequently I have selected points of particular, practical importance to the obstetrician, have discarded the rest, have embodied the result in a sketchy, suggestive article, and now call attention to matters upon which the treatises have little or nothing to say. Books labelled "Obstetrics" abound, they give explicit directions about making certain that the child's respiration is good and free, and in this they are commendable. But what is the accoucheur to do next? Here they afford a hiatus, and this question I will try to answer. Our whole duty to a child means more than normal breathing. It means that measures should be instituted to keep breathing normal. It signifies more than fitting a child to suckle, it indicates the institution of procedures that will maintain the ability to nurse for as long a period of time as may be desirable. It includes the delivery of a healthy child and the preservation of

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

its health. If this be not attainable one can at least aim at it, and must do so if he is to assert truthfully that he has done his best.

Two well-known malformations are "hare lip," with or without cleft palate, and "Tongue tie." Hare lip is never mesial but always (uni- or bi-) lateral. And when any malformation of the tongue is apparent then a malformation of the lower jaw should be sought for since both structures have a common origin known as the first pair of branchial arches. The same may be said of ankyloglossia or any adhesion between tongue and gums.

If the tie or adhesion interferes with the act of sucking, then the physician snips but not otherwise. A wider and modern view of this matter is that the movable tongue is provided in order that one of its employments shall be giving form to the mouth, the nose and the face. Compare it to a potter's hand and its work upon the inside of a vase which he is shaping, or to a mason's trowel fashioning the interior of a room or building. Pressure, resistance and counterpressure are forces of great efficiency in the development of children. Atmospheric pressure upon the outside of the human body must be counter-balanced by internal atmospheric counterpressure and all pressures, in this instance, must be smooth, even and elastic, free from bubbles or vacuum. Hence, it follows that a properly-shaped mouth should indicate a proper balance, internal and external, and should ensure a nose, a throat, a chest, an abdomen, a respiration, a circulation and a nutrition all working, growing, and exhibiting phenomena along the lines which we call natural law. But a badly-shaped mouth entails a badly-shaped nostril, a bent spine, a dented sternum, more or less displacement of abdominal structures and interference with respiration and nutrition. If the mouth and its second story (nose) cause an irregular intake of air, the emission of that air is necessarily also irregular. If the inlet of any pump is choked, then must the delivery be diminished proportionately. Therefore, no tie or adhesion of the tongue is trivial in its influence on the future health of the child: consequently examination and division should be the steps which lead to and from discovery.

Digital examination of the pharyngeal vault reveals a sort of net work (trabeculæ) easily differentiated from soft (adenoid) lymphoid masses in the spaces of its meshes. Sometimes the so-called "telephone wires" and other adhesions may be felt, varying in size from a thread to a closer and larger adhesion



between two surfaces; these should be broken up but the adenoids should not be interfered with unless they are thought to be overgrown and sufficiently large to threaten to obstruct breathing. Proportion in size, to the rest of the nasopharynx, is the best guide as to the necessity of crushing them gently with the finger tip. The velum palati must always hang free or be liberated. Massage usually fills all indications for radical treatment. The tactus eruditus, which the obstetrician has usually acquired to a far higher degree than the average throat specialist, makes his finger both investigator and soldier. Clinical experience only is lacking, solely because the matter has not been called to his attention. No doubt from now to future days the accoucheur will introduce his finger into the mouth of the neonatus and as a routine measure feel the frenum, estimate the freedom of the tongue, of the velum palati and pharyngeal vault. In short, he will (or should) make certain that the ventilation of the mouth, nose and pharynx is good, because bad ventilation is a chief cause of adenoids (lymphoid overgrowths) and their evil sequellæ. Atmospheric pressure is one force that keeps vessels, circulation and tissues of the nasopharynx normal in consistency and position, and this it cannot do if a vacuum is made at the spot where pressure should be obtained. A safe rule to adopt is, the baby should sleep with its mouth closed, if it does not then find out the reason for its departure from the rule.

If the nose is plugged with mucus, then it must be freed. Many of the maladies affecting people in adult life might (or so I think) have been averted by the careful use of a little cotton swab, made with a tooth-pick (say) and used to clean an infant's nose. This and keeping the child's mouth empty and shut will cause the cultivation of adenoid hypertrophies to become less usual. There is plenty of evidence justifying the commonplace idea that adenoids may bring about the bending of maxillary and facial bones but the matter should not be allowed to rest at a sort of half-way station. Removal of the adenoids will fail as a remedial measure quite as frequently as the adenoids will disappear without any treatment save placing the teeth and palatal arch in proper position. Furthermore, the adenoids will start another growth, after the removal of the original overgrowth, if the nasopharyngeal ventilation is bad. The affair is a vicious circle. The question of priority is equivalent to the unanswerable conundrum of "which came first, the hen or the egg?" This vicious circle begins anywhere but should have begun no-

where. It occurred to me that perhaps a side light on lymphoids of the pharyngeal vault as primary and constant causes might be obtained from a consideration of evolution and embryology. The results might be roughly stated as: 1. Jelly-fish before man; 2. abdomen before thorax; 3. liver before lung; 4. alimentary tract precedes respiratory tract; 5. germs of teeth (first set), seventh week; 6. union of hard palate, ninth week; 7. germs of permanent teeth, fifth month; 8. lymphatic glands, fifth month, and tonsil fourth month. Both sets of teeth are present in the gums at birth. If we are to draw any conclusion from the above it is that the influence of the teeth goes back to the seventh week and that of the adenoid to the fourth month of life. More than that I cannot say except that I have evidence backed by able opinions that the vicious circle is this, lymphoids cause malocclusion, nasal obstruction, etc., and malocclusion, nasal obstruction, etc., cause lymphoids to overgrow.

Few people, even physicians, have any conception of the power of the tongue and this organ must rest against the roof of the mouth. Therefore, its powerful moulding action is spoiled when resistance is lost by the mouth being opened either by having pacifiers or fingers thrust into it or for purposes of respiration. Dr. Bogue the orthodontist (*J. A. M. A.*, July 13, 1907) says, "I undertook to prevent a lad of ten years of age from placing his tongue over a tooth that I wished to examine. Three fingers and my thumb holding a mouth mirror were unable to control its movements. Anyone may protrude his tongue, hold it resistant and push against its side with a finger or two and obtain a clear object lesson as to the strength of the tongue in proportion to its size and its lack of the rigid bony supports (the phalanges) which are such great advantages to the push of the fingers.

Since keeping the mouth shut is the only possible condition under which the tongue may perform one important part of its duties it is surely evident that keeping the nose clean and free is a very much more important precaution than it is generally considered. Mechanical cleansing is often sufficient; if not, then dip the swab in cod liver oil. Should this not suffice use a saturated solution of perborate of soda. Soak the swab in this, clean the nose thoroughly with it, and follow the cleansing by instilling five drops of cod liver oil, with a medicine dropper, in each nostril. Gleason's formula of iodine gr. v., pot. iod. gr. xv., weakened by water, 4 ounces, may be used for swabbing.

Ordinary watery solutions, such as normal salt, used in an atomizer or douche can only be condemned, as their use in the case of a new-born infant is a sure forerunner of damage, trouble and disappointment. At least my experience has been such that I always mentally picture the nose as a pyramid without a bottom or a cup or a wash bowl upside down. Anything in fact that does not hold water, and that nature never intended for an aqueduct.

Anyone who has learned to pass a cotton wound probe through his own nose will scarcely be bothered by passing it through an infant's nose, particularly as a comparison will often demonstrate that, allowing for the difference in size, the infant's nose is the better shaped and consequently the more easily penetrated one of the two. The idea on which I wish to place emphasis is that the obstetrician has a finely educated touch; let him use his finger to examine the child's mouth, to crush adenoids, to separate adhesions and to free the velum palati. Let him remove the constraint of a tongue tie and insist that the nose be kept clean. Then as a matter of routine, let him make a digital exploration of the omega of the digestive tract, *i.e.*, the anus and rectum. Let him vaseline (lubricate) his finger, dilate and massage the sphincter and tear away any semilunar obstructive bands, which that finger discovers. Should he do this, the children under his care will have a better chance for future good health, they will look and appear better and become bigger and stronger than neglected ones. The results in my hands are exactly those which might be anticipated when a child is started in life and started right.

At present most obstetricians leave matters "to nature" so far as the future of the child is concerned. Think of the consequences of this leaving to nature. The microbe must receive more care from Nature than the child, since Nature has guarded (I wish I could say safeguarded) the latter by placing it under the protection of parents. These in turn seek the skill and training of the obstetrician as an additional protection. He must understand and know that Nature has a scheme by which she prepares plants for the animal's food, but that scheme includes with equal force that the dead bodies of animals shall nourish plants for future generations of animals. The natural impulses and influences that work on a child are bad because they are not corrected by intelligence and experience. That is why the average child desires to eat pink matches when

left to Nature and would do so were it not safeguarded by parental intelligence and vigilance. Nature furnishes an animal with a bite and an evacuation. The obstetrician can make sure that both bite and evacuation are good by commencing the care of the mouth and the anus at birth. With a poor bite and poor evacuation the child's body will soon go to fertilize the earth from whence it came. In the civilized state, not leaving things to nature, but interfering with the natural by artificial but carefully regulated diet may prolong life, but even here some proverb such as "the stomach has no teeth" holds good until gastric ulcer or cancer conclude the struggle for existence.

#### SUMMARY.

The obstetrician may institute measures to give a child a good mouth and good anus.

Without either or both of these the animal economy and mechanism must perish, prematurely.

The deleterious influence upon bodily health of mixed cultures found in the mouth, call it rheumatism if you like, and the able seconding for evil of the colon bacillus, are not made worse by steps which may easily be taken by the obstetrician having for his objects the rendering of a mouth normal and self cleansing, and putting the anus in the best possible condition for free drainage.

I have discussed this matter with many men who are studying the subject and all agree that the steps suggested would certainly tend to improve health and prolong life, but I think it stands to reason that such accidents as depend upon poor or dim hearing for a cause may also be averted, because the commonest causes of deafness are forestalled. It may seem that I take too much for granted. This may be so, but the embarrassing question has been what to leave out, consequently I feel that my statements are very conservative indeed and I should be most happy to discuss any matter which may seem vague. Details, statistics, measurements and all the essentials of a strictly scientific paper would require a review of several sciences and the only course open to me is simply to assert and leave the "How do you know" elements to be substantiated by the physiologist, the orthodontist and the embryologist and their findings to be confirmed by the bacteriologist, as they will be, have been and are confirmed according to letters, writings and statements in my possession.

HYSTERECTOMY FOR THE CURE OF PROLAPSUS OF UTERUS.<sup>1</sup>

BY

WILLIAM A. B. SELLMAN, M. D.,

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(With one illustration.)

It has happened so frequently that plastic operations upon the vagina, perineum and the suspensory ligaments of the uterus have been unsatisfactory in the final results, that we believe that a more radical operation is required and we are convinced that supravaginal hysterectomy is indicated in many cases of prolapsus uteri.

Having a patient fifty years of age, past the menopause, the uterus always down within the vaginal tube and when assuming the erect position presenting outside of the vagina, the organ hypertrophied in many instances as large as a good-sized Duchess Pear or a Politzer ear distending bag, can we promise to overcome the procidentia by the use of a distending vaginal pessary or by an operation for removing the superfluous vaginal tissues or by closing the ruptured sphincter muscles of the rectum and vagina? The experience of expert operators is that even with the Dudley, Watkins or Baldy technic we fail to make these patients comfortable. If the uterus be suspended or fixed into the anterior abdominal wall, the heavy weight of the organ dragging upon these structures will place the patient in a most uncomfortable condition besides interfering with the functions of the bladder and intestines.

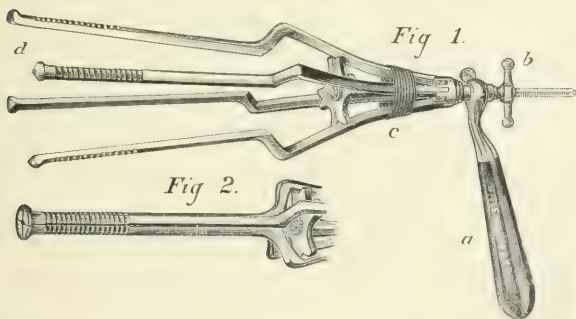
If a woman has passed the child-bearing period, the uterus no longer possesses a function, the ligaments and natural supports have become so changed that they have lost the power to support and maintain the organ in a normal anatomical position. The enlarged uterus is crowding the adjacent organs and on account of the increased size is pressing and compressing arteries, veins, nerves and lymphatic channels, the circulation is disturbed and various nervous reflexes are developed which are felt throughout the entire body. The patient is nervous, hysterical and distant organs are affected by the disease located in the pelvis.

The patient probably expects to have a pessary placed or an operation suggested for the repair of a lacerated perineum which

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

she is aware of having existed for many years. When the gynecologist informs her that the abdomen must be opened in order to shorten the ligaments supporting the uterus or to carry out an anterior fixation operation, the patient is liable to become alarmed at the prospect and insist upon a trial of the plastic operation.

Should the gynecologist go further and suggest a complete or partial removal of the uterus, the anxiety and alarm of the patient is increased, for it is difficult to convince the public of the necessity for the removal of a useless and disturbing organ. The horticulturist will remove the decayed and useless limbs when their presence is affecting the vitality and symmetry of an otherwise healthy tree. Why should not a uterus be removed which no longer possesses a function; which by its presence is a dis-



turbing organ reflecting its baneful influence over the entire body, and which cannot be maintained in position by other operations?

At the present time in skilful hands there should not be any greater mortality than that which attends the Dudley, Watkins, Hirst or Bandler operations. In those cases of procidentia in which we have large urethrocele, cystocele and rectocele, besides a lacerated perineum, in the various degrees of destruction, we should, after the patient has recovered from the effects of the hysterectomy, perform a second operation to repair these conditions. It is useless to remove the uterus and allow the redundant vaginal tissue to remain. The patient will be uncomfortable as long as the lacerated perineum remains unrepaired.

Because a woman is from fifty-five to sixty years of age is no



reason why she should be left with a procidentia uteri for the remaining years of her life. I have operated upon patients over seventy years of age with most successful results. The general practitioner too frequently decides that no operation is justified after the menopause, as he takes the view that the genital organs undergo atrophy after this period and nature will accomplish all that is required. He will probably insert a pessary to prevent the uterus sinking down into the vagina. Some go so far as to suggest the wearing of the barbarous cup pessaries with a stem to which are fastened rubber cords attached to a belt placed around the waist.

I wish to impress upon the rural practitioner the necessity of referring his cases of procidentia uteri to the specialist. Experience and capability of skilful operative technic of the highest order is required to cure these cases. Simple operations to repair a lacerated perineum, or shorten relaxed vaginal walls do not avail in this class of cases. The enlarged uterus must be held up by fixation, which frequently leaves the patient in a most uncomfortable condition or the organ must be removed by an abdominal operation. I do not favor the vaginal route and if the appendages are in a normal condition I leave them behind. The technic of the operation is important. Where it is possible the divided broad ligaments should be sewn together over the neck of the uterus, which should be left behind whenever possible. The supravaginal operation is always indicated although there are cases in which we are compelled to remove the entire organ on account of the hypertrophied condition of the cervix.

5 EAST BIDDLE STREET.

### PROPERITONEAL HERNIA.<sup>1</sup>

BY

WALTER C. G. KIRCHNER, A. B., M. D.,

St. Louis, Mo.,

WHILE the condition known as properitoneal hernia is one that is but rarely met with, still the recognition of this class of hernia is of such importance that a consideration of the subject should receive proper attention in the field of abdominal surgery. Of great importance is the early diagnosis of this condition, so that by surgical treatment a satisfactory cure may be established. Unfortunately, however, most cases are seen in the

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

stages when grave symptoms of bowel obstruction are present, and the patient's chances of recovery are, therefore, greatly lessened.

By properitoneal hernia, we wish to designate that type of interparietal hernia in which the hernial sac is situated immediately external to the peritoneal lining, and the sac therefore usually occupies a position which is intraabdominal in character. In the simple properitoneal hernia, which is comparatively rare, there may be no external evidence of tumor.

Frequently the sac of an interparietal hernia is bilocular in character, and in these cases both compartments have a common orifice which opens into the abdominal cavity. The inner compartment lies between the peritoneum and the transversalis muscle or fascia and is therefore properitoneal in character, while the outer occupies either the inguinal or the femoral canal. It is possible also for the outer compartment to occupy a position between any of the layers of the abdominal wall. An analysis of the interparietal hernias shows that many are bilocular, and Coley, agreeing with Moynihan, is inclined to group them under one class, namely, bilocular hernias, though it seems more distinctive to designate the hernias according to their anatomic location. The bilocular forms are in reality compound hernias, each locus or portion of sac having its special coverings or anatomical relations. The properitoneal hernia on account of its concealed position is of especial importance, and the following case reports may serve to emphasize certain points relative to diagnosis and treatment.

CASE I.—The patient was a colored man forty years of age, who took sick suddenly with pains near the right inguinal region. On the day following the attack of illness, the symptoms persisting, the patient began to vomit, the vomitus later becoming fecal in character. He was admitted to the hospital on the fifth day of his illness, May 9, 1905, with a diagnosis of appendicitis.

When he entered the hospital his abdomen was distended and tympanitic, and his features bore a pinched and anxious expression indicating serious abdominal trouble. His temperature was 100° F., respirations 24, pulse 104, and he was vomiting fecal matter. It was evident that he was suffering with a widespread peritonitis, and from the history and symptoms, this was probably caused by bowel obstruction. No history of hernia could be elicited other than that at times there was a sense of fullness in or near the right inguinal region, and on examination no swelling in either inguinal region was noticed nor was there

impulse on coughing. The external inguinal ring on either side was of normal size, and the condition was not associated with undescended testicle. The patient was in a serious condition and was at once prepared for operation.

*Operation.*—Median incision below the umbilicus was made and a considerable quantity of serosanguinous fluid evacuated. The bowel, of brownish-red color, was distended with gas, and contains liquid fecal matter. In the region to the right of the bladder, a tumor-like mass about the size of the fist was encountered, and it was learned that this mass was a sac containing strangulated bowel. The opening of the sac formed a ring which constricted the bowel and which, when severed in a direction toward the median line, was not attended with hemorrhage.

The sac contained 18 inches of gangrenous bowel, the condition being such that resection was necessary. Anastomosis was made with the Murphy button, the proximal portion of intestine having first been drained of its contents by means of a rubber tube which was fastened into the gut. The sac had no communication with either the internal or external inguinal ring. It was brought forward and after independent drainage was established, the opening was sutured to prevent recurrence of the trouble. The peritoneal cavity was copiously flushed with saline solution, drains were placed, and the abdominal wound was closed. Four days after the operation, the patient died suddenly, apparently from acute cardiac dilatation due to septic myocarditis. At the autopsy, the sac which was as large as the fist, was found adjacent to the right side of the bladder and on account of the invagination caused by the hernia, there was on the internal side a double layer of peritoneum. The opening, nearly  $\frac{3}{4}$  inch in diameter, was situated behind the external ring, and the inguinal canal itself was intact. The margin of the ring was thickened, indicating that the condition had existed for some time.

CASE II.—The patient was a white male, sixty years of age, who desired an operation for a right femoral hernia. He had, in addition, cystitis and retention of urine, due no doubt to the presence of a urethral stricture.

On January 25, 1908, an operation for femoral hernia was undertaken. The incision was parallel with the vessels and the sac was isolated. The sac contained omentum which had become adherent. The omentum was liberated as high up beyond the ring as possible and was severed. The cut end did not retract into the abdominal cavity as readily as is normal in these cases, but this condition was explained by the presence of adhesions. After high ligation of the sac and removal of the redundant portion, the stump, was allowed to retract toward the abdominal cavity. The fat about the opening was removed, and the operation was completed with the usual skin closure.

The patient stood the operation well, but in a few days, owing to the urinary conditions, the wound became infected. He

became nauseated and vomited and it was thought symptoms of peritonitis were present. Five days after the first operation, a second operation was performed which was exploratory in character. An incision was made through the lower portion of the right rectus muscle and on examination, the omentum was found to extend through a small ring in the peritoneum and to occupy a sac to the right of the bladder. The omentum was delivered from the sac, and the matted portion was ligated and removed. There was no peritonitis. The bladder was distended and the urethral stricture having been dilated, the bladder was irrigated.

The original condition was now more clearly understood. There had existed a bilocular hernia, one portion of the sac contributing to the formation of a femoral hernia, the other portion to a properitoneal hernia. The contents of both loculi consisted of adherent omentum. The patient died on the day following the operation. The autopsy revealed a cellulitis of the right inguinal and femoral region, ureteritis, cystitis, dilatation of ureter and pyelitis.

In a series of some 500 operations for hernia, the condition of properitoneal hernia was encountered but twice or in 0.4 per cent. of the cases. Interstitial hernia was encountered more frequently and was associated usually with undescended testicle.

The earliest description of the properitoneal hernias was given by Parise in 1851. Kroenlein in 1876 and later in 1880 made a comprehensive study of types of hernias and collected twenty-three cases. Later a pupil of his, W. Breiter, collected in 1895 thirty-six additional cases. The subject has also been reviewed by Moynihan, Macready, Sultan, Coley and others, and interesting speculations as to the cause of these hernias have been made.

In the light of modern research, abundant investigation has demonstrated that in most cases, hernias associated with the inguinal or femoral canals occur in preformed pouches and may be regarded as of congenital origin (Cohn, Rokitsansky, Russell, etc.). This conception in the formation of hernia aids us greatly in explaining the occurrence of interparietal and bilocular hernia, especially when associated with congenital defects. Most cases occur in the male and are associated with imperfect descent of the testis. However, in the cases herewith reported, no such anomaly was present. In Case I, the hernia was properitoneal and monolocular. In Case II, the hernia was bilocular, the inner locula being properitoneal while the outer was found in the femoral canal. The bilocular form is the one most frequently met with, although it is rare to find the outer sac in the femoral canal. In some instances, the theory of the formation of hernia

on the basis of prenatal origin does not seem to maintain, and the condition may be explained by a study of the anatomical relations of the inguinal canal or by the formation of the internal portion of the abdominal wall which often presents pouches in which the obliterated hypogastric artery plays a not unimportant part.

The inguinal canal, according to Eppinger, may be divided into three portions. The first portion begins at the internal ring and extends to where the infundibuliform fascia enters the transversalis muscle. This portion of the canal is surrounded by preperitoneal areolar or fatty tissue. The second portion of the canal is surrounded by the transversalis and internal oblique muscle which make the walls of this portion of the canal resistant. The third portion extends from the internal oblique muscle to the opening in the external oblique muscle and here again there is usually a deposit of fat and loose tissue. Owing, therefore, to the nature of the surrounding structure of the canal, interparietal hernias may occur at either the first or third part of the canal. If a pouch is developed in the first portion and its progress along the canal is impeded, for example, by undescended testicle or by hydrocele of the cord or of the canal of Nuck, a hernia of the properitoneal type may develop and the sac may be situated either internal or external to the ring. More frequently the sac develops in the third portion producing the interstitial type of hernia.

If a sac having thus originated in a part of the inguinal canal is also prolonged along the inguinal tract, the bilocular type of sac is produced, and both loculi will have a common opening which leads into the abdominal cavity. Whether the above explanations maintain, whether the properitoneal hernias are due to "*reduction en masse*" to congenital abnormalities, to the formation of first an inner and later an outer sac, or *vice versa*, there are anatomical considerations due to formation of the internal abdominal wall that may at times be of equal importance. If the region of the inguinal or femoral canal be examined from the internal or peritoneal side, a number of pouches or depressions will be observed. A number of investigations relative to the nature and formation of these pouches were made in the anatomical room by Dr. Wm. T. Coughlin, and also by myself, and it was found that the obliterated hypogastric artery by throwing the peritoneum into folds, played an important part in the formation of these pouches or fossa which would predispose to the formation of hernia, especially of the properitoneal type.

In Case I, the hernial opening was posterior to the external ring and was in relation to the obliterated hypogastric artery. The sac took an inward direction and was perivesical in its relation to the bladder. It was unilocular and had no connection with the inguinal canal. We have observed cases in which a knuckle of bowel was caught in the first portion of the inguinal canal (Richter's hernia) and it seems plausible for a hernia to likewise originate in any of the pouches of the inner side of the abdominal wall. I believe the properitoneal hernia in Case I must have developed in a similar manner.

In Case II, the inner sac may have originated in the region of the femoral ring and formed first the properitoneal sac and later the femoral sac, as the femoral sac may have developed first and by efforts at reduction, the properitoneal portion was produced. However, in the light of modern investigation as shown by Russell, one or more congenital or preformed pouch may be present in or near the femoral canal, and I am inclined to consider the hernia in this case as one of prenatal origin. As to the etiology of these hernias, it seems best to consider each case by itself, for it is probable that a number of factors are at work in their production.

Compared with the inguinal variety, the cruro-properitoneal type is much the rarer form, and Breiter has collected only nine cases. Bull and Coley were the first to report the occurrence of properitoneal hernia in the female, three such cases having been observed by them.

The symptoms of properitoneal hernia depend mostly upon the condition of the bowel which is involved, and when present, are characterized usually by those of acute or subacute strangulation. A patient with a properitoneal hernia may go along for years and only realize that something is wrong when strangulation of bowel has occurred. In general, the symptoms may differ in no way from those which would be produced by hernias of the ordinary type.

The diagnosis is important though it is usually made with some difficulty. In certain cases, there being no physical signs present, the diagnosis may be impossible and the true condition is only learned at operation or at autopsy. Tumefaction which was present, in twenty-two out of thirty-six cases in Breiter's collection, may be found and is an aid in diagnosis. By rectal digital examination, it may be possible to detect the mass of a properitoneal hernia when situated in the pelvis. The relation of pro-



peritoneal hernia to undescended testicle should be borne in mind, for certain of the cases are of congenital origin. Special effort should be made to determine, if possible, whether the sac of the hernia is monolocular or bilocular, and to notice if the condition resembles a hernia which has been reduced *en masse*. Strangulation may occur at the neck, common to both sacs, at the neck of either of the sacs of a bilocular hernia, or at the abdominal ring. In a monolocular hernia, the entire condition may be concealed.

The treatment of a properitoneal hernia is surgical, and as most of the cases are seen late, this resolves itself into the treatment of strangulation or of obstruction of bowel. The properitoneal sac may require special treatment and is at times difficult to eradicate. In the multilocular variety, the properitoneal sac should be carefully examined and its contents treated for in certain instances, it is easy to overlook the inner sac. Owing to the concealed nature of the sac, an abdominal operation will usually be found the most satisfactory.

In conclusion it should be remarked that in the diagnosis of strangulated bowel, properitoneal hernia should receive proper consideration.

That in operating for simple hernia, one should have in mind the possibility of multilocular sacs, the innermost one being properitoneal in character.

That properitoneal hernia, while most frequently congenital in origin, may also be acquired, as is shown by a study of anatomical specimens.

That the condition is frequently overlooked or goes unrecognized until the symptoms of bowel obstruction are present, when urgent surgical measures furnish the only means of relief.

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METROPOLITAN BUILDING.

TUBERCULOSIS IN ITS RELATION TO PREGNANCY,  
LABOR AND THE PUERPERIUM.<sup>1</sup>

BY

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THE subject of tuberculosis, and in particular, pulmonary tuberculosis, is to-day attracting worldwide attention. In this country alone, millions of dollars have been expended in the endeavor to check the onslaught of this devastating disease. Volumes have been written on the etiology, prevention and treatment, and yet, I find that in the United States, only a comparatively small number of the many thousands engaged in this fight against the "Great White Plague" have turned their serious attention to the relationship of tuberculosis to parturition. What is being done for these unfortunates to-day? The superstition is still prevalent among the laity, and even among a considerable number of the medical profession, that pregnancy is on the whole *not* harmful, yea, that it may at times be of benefit, to the woman afflicted with a tubercular lesion. Supposing even that the more progressive practitioners admit that pregnancy is *not* desirable for a tuberculous woman, how many of these realize the actual seriousness of this relationship? The fact is, and I shall now endeavor to convince you thereof, "*the strain of child-bearing exhausts the vitality of the tuberculous subject, and in a high percentage of cases brings about an untimely end.*"

I will ask you to consider the subject with me in the following order:

1. The effect upon the pregnant woman, of an active tubercular lesion.
2. Tuberculin reaction during pregnancy.
3. What effect does an active tuberculosis in the parent have upon the offspring?
4. What shall be our attitude in regard to lactation?
5. Treatment.
6. Tuberculosis and marriage.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

(1) The effect upon the pregnant woman, of an active tubercular lesion. This admits of two subdivisions,

A. Does parturition lay the foundation of tuberculosis?

B. Is an existing tuberculosis aggravated by parturition?

(A) Fishberg states that in 286 married tubercular women under his care, 107 or 37.4 per cent. claimed that they had had no pulmonary symptoms until after one or more childbirths, and P. Jacob and Pannwitz, that in 337 cases of tuberculous women, 25 per cent. traced the origin or aggravation of the disease to pregnancy. Again, Maragliano in 385 women found that 226 or 59 per cent. believed the tuberculosis had started during parturition. Trembley, Charles C. (Saranac), says in this connection that a compilation of the histories of tubercular women who have borne children reveals an astounding number of cases which attribute the onset of their symptoms to pregnancy and parturition. In his series of 240 cases, 151 or 63 per cent. gave a positive history of a tuberculosis originating or at least definitely recognizable after the birth of a child. In some instances the definite recognition of the disease was some weeks or even months after the confinement, but investigation revealed the fact that following delivery a condition arose, variously diagnosed, which eventually proclaimed itself as tuberculosis. Although these figures may be open to some error, still *they do show that, in many cases at least, pregnancy—especially if rapidly repeated—is directly responsible for the development of tuberculosis in a susceptible individual, or may cause a dormant tubercular lesion to be rekindled.*

(B) *Is an existing tuberculosis aggravated by pregnancy?* In a subject of this character, a subject in which accurate data are hard to obtain, it is not perhaps strange that differences of opinion still exist. We cannot, however, deny that the majority of those who have been close students of this question firmly believe in the baneful effects of pregnancy and the puerperium upon all types of *active* tubercular processes.

Lebert states that 75 per cent. of tuberculous cases are badly influenced by pregnancy and the puerperium; Deibel, 64 per cent.; v. Rasthorn, 70 per cent. Kamminer found that 66 per cent. of his list were influenced perniciously, but that the mild cases showed no change. v. Bardleben writes that from the communication of fourteen correspondents 71 per cent. grew worse from parturition; and further, that from the statements of nineteen correspondents, 47 per cent. of the active cases proved fatal.

Ellis Essen-Möller found either severe aggravation or death in 50 per cent. of his cases.<sup>1</sup> In a series of our own, published in 1908,<sup>2</sup> 34 per cent. were mild cases, with slight cough and moderate temperature reaction. In all these mild cases there was a moderate aggravation of the symptoms in the course of the pregnancy, but in most of these, this aggravation subsided within eight to twelve weeks after labor; 16 per cent. were chronic, healed cases, showing no symptoms; in 12 per cent. the cases were severe in type. All showed a marked decline during the last trimester of the pregnancy. In these, the cough was very troublesome, the sputum abundant, the temperature curve irregular. There was decided loss of flesh and strength during the last two months of pregnancy. In 38 per cent. of the cases the disease was far advanced when first seen by us. These thirty-eight cases were all, undeniably, seriously affected by parturition. Nineteen cases died (one in the eighth month, undelivered; two in labor; sixteen in the early weeks postpartum).

The bad cases seem to lose ground rapidly either during labor or within a few days thereafter. These two periods can therefore be regarded as the periods of the most acute danger.

During the puerperium the tuberculosis may at any stage assume a fulminating character and may cause death in a surprisingly short space of time. This can occur in all types, with active lesions and occasionally even in cases of only moderate severity. I would accentuate this statement for it is generally not recognized.

Since 1908 I have personally met with approximately forty additional instances of this complication. In this series, thirty cases were mild in character. All of these passed through the pregnancy without serious features and yet, in almost every case, there developed toward the end of pregnancy a moderate aggravation of the temperature curve with or without cough. If there had been any gain in weight in the middle trimester, this gain was changed to a loss either in the last month of pregnancy or in the first six weeks postpartum. Ten cases were severe in type. As in the first series I find that in all of these ten cases the pulmonary condition was markedly aggravated by

<sup>1</sup> Trembley (Saranac) says that "In nearly every case of quiescent or arrested tuberculosis, and in all cases where the process was progressive, the pregnancy or the puerperium was attended by very serious renewal of activity, resulting either in dissemination of the disease throughout the pulmonary system, or in attacking other parts of the body."

On the other hand, *Pinard*, from the study of over 7,000 obstetrical cases, claims that the dangers from this complication have been greatly overdrawn.

<sup>2</sup> From the services of the N. Y. Lying-In Hospital.

the pregnancy. Of the ten cases six died within three months after the labor.

This series of forty cases included a number of private patients who were able to spend the greater part of the pregnancy in the country or mountains. The difference in the results and deductions of some clinicians must be due, I think, to the differences in the severity of the disease in the several clinics. The results depend to a considerable degree upon the social status of the patients. *The poor laboring women suffer the most severely.*

To obtain accurate data the patients must be followed for at least three months after delivery. Repeated pregnancies are especially undesirable.

*Laryngeal Tuberculosis.*—All observers seem to agree that laryngeal tuberculosis complicated by pregnancy is a source of the gravest danger to both mother and child. This statement is confirmed by such men as Grosskopf, v. Rosthorn, Kuttner, Juracz, Freudenthal, Sokolowsky, Pankow, Hellenhall. Kuttner claims that 90 per cent. of active cases are doomed thereby to an early death. Of 231 compiled cases 200 died during labor or soon thereafter. Abortions and premature labor are especially prone to occur with laryngeal tuberculosis. About 75 per cent. of the infants succumb during labor or soon after.

*Tuberculin Reactions during Pregnancy.*—Wolff-Eisner, Robert Stern (Breslau), Bar, and others, have shown that a "lessened reaction to tuberculin tests" is seen during pregnancy. This *lessening* of susceptibility, progresses up to the time of labor, then gradually returns to the normal degree of reaction. Bar in a group of thirteen pregnant women, with râles and temperature, found a positive reaction in nine cases, and a negative one in four. Of these four cases all were much worse at the end of the pregnancy and two died. Of the nine positive cases, three had a particularly marked reaction and at a later date seemed to improve. Bar, Schmorl, Schlimpert and a few others believe that the "lessened susceptibility" during the last trimester of pregnancy *may* be due to a developing tuberculosis of the placenta. This latter condition, as we shall later observe, may not be as uncommon as has generally been supposed.

*To Summarize.*—From the figures so far presented we may, I think conclude with some positive degree of assurance, that

1. Cases with a "healed tubercular focus" may proceed through pregnancy, labor and the puerperium with little or no disturbance.

Rapidly repeated pregnancies have a tendency to cause a renewed outbreak.

2. Latent tuberculosis *not* infrequently becomes an active tuberculosis, under the damaging effect of parturition.

3. Mild cases with slight temperature and moderate cough *may* stand the strain of pregnancy, with apparently little damage; on the other hand, many even of these mild cases are aggravated thereby (35 to 60 per cent.).

4. The deleterious effect is seen, without question, in the majority of the *more severe* cases. In *all* advanced stages of the disease the danger is very great, terminating in practically all cases in an early death.

5. The two periods of greatest danger are (a) during labor and (b) in the early puerperium.

The prolonged muscular exertion of the labor (the labor should be made as easy as possible), the loss of blood, with its attendant exhaustion, the use of anesthesia and the possibility of renewed toxins or tubercle bacilli being thrown into the system from the placental site by the action of the uterine contractions are *all* serious and far-reaching in their results. The puerperium is the period in which the greatest number of the deaths occur. This is dependent in part upon the damaging effect of labor, in part upon rapid katabolism, and in part upon tubercular lesions of the placenta, uterus or Fallopian tubes. Moreover, the puerperium is all too frequently the starting-point of a tuberculosis of the lungs.

III. What *effect does an active tuberculosis in the parent have upon the offspring?*

Pregnancy occurs readily in the milder forms of pulmonary tuberculosis. In the more advanced cases susceptibility to impregnation is, I think, somewhat lessened. After conception has taken place, it is but reasonable to suppose that abortions are somewhat more common than in nontubercular cases. This is partly due to the cough, partly to the vomiting, or to the temperature; it may be due to an endometritis or to a beginning tuberculosis of the decidua. We find, moreover, that the tendency to premature labor is even greater than the tendency to miscarry. This is particularly seen in tuberculosis of the larynx. When the disease is stationary or when the pulmonary condition is but moderately active, it is possible for the tuberculous woman to bring forth an apparently well-nourished, active and healthy child. This fact is but seldom noted in the severer



grades of tuberculosis. While apparently some children are born healthy, they are more frequently found to be poorly nourished and underdeveloped. Moreover, the majority of the apparently healthy children, if kept under observation beyond the short obstetrical period, show a tendency to develop signs of malnutrition or of tuberculosis itself, unless they are fortunate enough to be watched over with extreme precaution.

*Congenital tuberculosis* does occur, but only in exceptional instances. Of late, a number of the best foreign observers have been disposed to believe that a good many of the so-called early postnatal infections have in reality been cases of intrauterine infection. Certainly in the light of the recent work on tuberculosis of the placenta, etc., this possibility should be carefully weighed. Francine contends that the tubercle bacillus may lie dormant in the lymphatics of the new-born and not become active until some weeks after birth. To-day such men as Jung, Schmorl, Baumgarten cling strongly to the belief that *not* infrequently tubercle bacilli are to be found in the blood of the new-born. Even if we believe that the "villi" must be damaged in order to allow the passage of tubercle bacilli, we may still readily appreciate how this injury can take place during the height of the labor. Schmorl, Schlimpert, Norak, Ranzel, and others, consider it quite possible and probable that during hard uterine contractions tubercle bacilli are forced from the placenta into the fetal circulation. According to Weinberg, 67.9 per cent. of infants of tubercular parents, whose mothers died within one year after labor, died likewise within the first year of life, as against a normal death rate of 25 per cent. Of fifty-seven infants born alive, whose mothers died within four weeks of labor, 78.8 died within the first year. If to these early cases we add the vast army of children that later develop the disease from contact with the tuberculous parent, we will appreciate the great toll on health and life, due to faulty inheritance and faulty surroundings.

Miller and Woodruff (New York) found that 51 per cent. of 150 children of tuberculous parents were positively tuberculous, and that 20 per cent. were doubtful. Floyd and Bowditch (Boston) have shown that 36 per cent. of the children of tuberculous parents gave definite signs of tuberculosis of the lungs and 30 per cent. of tuberculosis elsewhere. P. F. Armand-Delille has recently proven that 238 out of 396 children of tuberculous parents, *i.e.*, over 60 per cent., developed pronounced

tuberculosis when left in more or less constant contact with their parents.

IV. *What then shall be our attitude in regard to lactation?* Women with passive and mild pulmonary tuberculosis may at times nurse with impunity both as regards themselves and their offspring. This, however, is surely *not* the rule. Nursing of an infant by a known tubercular woman is a double menace and should, I believe, never be allowed. This I consider all-important, if our warfare against tuberculosis is to make progress. The mother's strength has been sorely tested; the nursing will inevitably be an additional drain on her vitality. In even the mild cases nature requires every chance in order to overcome the tubercular lesion. Both pregnancy and lactation abstract calcium salts from the body economy, salts of great value to the patient in her pathological state. Again, even though the mother may seem in fairly satisfactory condition during the early weeks of the puerperium, her ultimate recovery is yet more likely to be retarded, if nursing is indulged in. This I have seen time after time. In advanced cases, nursing is absolutely to be condemned.

*In Regard to the Child.*—The child enters life as we have just seen heavily handicapped. The two essentials for its welfare are (1) proper nutrition, (2) wholesome surroundings. Although breast milk is the ideal food for these infants, although the mother's milk may cause a gain in weight, and although human breast milk contains tubercle bacilli *only* in most exceptional cases, nevertheless I believe firmly that the majority of such children will thrive better on the milk of a wet-nurse or on cow's milk properly prepared. Should nursing be allowed, it should only be carried out under strict supervision, ever mindful of the great danger of contamination from the mother.

In all truly active cases the ideal method is the isolation of the child. To the parents, to the friends, yea to the average practitioner this may seem unnecessary and even cruel; but, gentlemen, such a course *is* essential if the tender life is to be preserved.

Recall once again our figures—50 per cent., 60 per cent., even 75 per cent. of infants (according to Lebert) die in the early months when born of tubercular parents and when allowed to remain in contact with them. The truth of this high early mortality has been verified by many observers such as Kamminer, Deibel, Ysendick, Pfortner, and the writer. The deduc-

tion I would impress upon you, then, is that *maternal lactation is on the whole bad both for the mother and for the child.*

#### TREATMENT AND GENERAL MANAGEMENT.

(1) General treatment.

(2) Obstetrical treatment.

The medical and hygienic treatment resolves itself into practically the same general methods that are employed in nonpregnant tubercular women. The difficulties, however, are far greater and yet these cases are more in need of judicious care and advice; good food, an abundance of fresh air and a quiet mode of life, than perhaps any other class. These difficulties depend essentially upon three factors: (a) many of the patients being married, cannot or will not leave their city home—whether private house or tenement—to go to the country for a sufficient period to make the change of real value. (b) Being pregnant and tubercular, they are refused admittance to the majority of “charitable homes” or sanitarium. Even in the last weeks of pregnancy they do not find a cordial welcome, if the tuberculosis is severe, excepting in a small number of hospitals. (c) With the present system of hospitals, sanitarium, etc., it is difficult to seek health away from home, owing to the insufficient provision made for competent obstetrical care. What these poor afflicted ones need is better supervision from the beginning of pregnancy and watchful, diligent treatment for at least six months after the abortion or the birth of the child.

(2) The obstetrical management divides itself into four operative procedures:

(a) Simple artificial abortion.

(b) Artificial abortion followed either immediately or at a later date, by resection of the Fallopian tubes.

(c) Abdominal or vaginal hysterectomy after the removal of the fetus.

(d) Artificial abortion followed by “excision of the placental area” per vaginam.

Remembering then that pregnancy is frequently the “initiator” so to speak of the tubercular state, that it usually aggravates an existing tuberculosis, that the severe cases are hurried to an untimely death, and recalling, moreover, that the child, if born alive, is inevitably greatly handicapped, it would seem to me that operative interference is demanded under the following conditions:

During the first three to four months of pregnancy an abortion should be performed where possible in all active cases, and the less delay there is the better. In cases with the tubercular tendency, but with no active lesion, this operation is *not justifiable*; it is *not* indicated in cases with healed lesions providing the patients are in good general health. If the operation is performed early in pregnancy, under the strictest aseptic precautions and preferably after a preliminary twenty-four hours' tamponage with 5 per cent. iodoform gauze, it will disturb the patient but little, and will in most instances forestall the more serious changes incident to uninterrupted pregnancy. All operations performed under these circumstances demand light and scientifically administered anesthesia. Furthermore, I believe that after emptying the uterus it is a distinct advantage to lightly tampon the uterus with 40 to 50 per cent. alcohol gauze for twelve hours. After recovery from the curetage, the hygienic treatment should be resumed with earnestness and should be continued as long as possible. While the therapeutic abortion is so often indicated, the induction of premature labor is *not*. It is well, at this point, to state emphatically that a consultation is essential before undertaking any one of the operations under discussion. This is required both for the benefit of the patient as well as of the surgeon. I know scarcely anything that is more disturbing than after a legitimate curetage for tuberculosis to have the patient return a few months later with the sad story "of another slip up" despite all precautionary measures. The perplexing question has to be faced anew and is really in actual practice a difficult one. Obviously such a result is not satisfactory. In order to treat these patients with greater intelligence, the operation of salpingectomy is now being widely urged in all *active early mild* cases in which the uterus is emptied. All patients will not submit to this, but I believe, after a careful study of the question, that the operation should be considered. By emptying the uterus in these early mild cases the patient's health may be restored and life prolonged many years. If in addition, a salpingectomy is performed (this I am not now ready to advise in all cases), the patient's health will stand a far greater chance of remaining good, and all danger of bringing poorly nourished offspring into the world will have been removed. It is in these *mild cases* that we find the greatest hope from radical interference and yet it is in this very type that the greatest laxity exists

among the profession and laymen in the event of pregnancy. In pulmonary tuberculosis of *greater severity* seen during the *first three to four months* an abortion should be performed; but this operation may prove of more value if followed immediately by abdominal or vaginal hysterectomy. Radical interference, as I shall presently show you, is the only way of offering these women a fair chance of improvement. Veit, from a study of 347 collected active cases in which abortion alone was performed, has shown that 43.3 per cent. were not helped by it, while v. Bardleben claims that 50 per cent. of his actively progressing cases died after artificial abortion. Weil advises early abortion but cites two cases that developed acute miliary tuberculosis after operation. Klein, Thorn, Rose and Hunziker have likewise reported instances of acute miliary tuberculosis after this operation.<sup>1</sup> During the middle months of pregnancy, artificial interruption is only to be undertaken when the disease is *progressive* in character and this operation should here also be followed by either abdominal hysterectomy, as advised by Bumm and Henkel, or by vaginal excision of the body of the uterus. In those cases that are found to be failing *rapidly*, whether it be during the middle trimester or late in the pregnancy, no operation will prove of much value. This fact is important. In this group, conservatism is indicated and conservatism only.

*Why are the results so unsatisfactory in the severe cases?* In order to answer this important question we are forced again to study the investigations of foreign observers. From them we learn that despite the teaching of the past few years the high morbidity and mortality are dependent upon a tuberculosis of the placenta. It is now believed by many thoughtful students of the subject that tuberculosis of the decidua and placenta is far more common than has heretofore been admitted. As late as 1905 this occurrence was deemed to be exceptional (Schmorl, Geipel, Wollstein, etc.). Since then, however, in the effort to explain these phenomena, a far more painstaking study has been undertaken. With greater patience and with renewed diligence, even studying many hundreds of sections from a single case, tuberculosis of the decidua and placenta has been found to be of frequent occurrence. Schmorl, Geipel, and Wertheim *now*

<sup>1</sup> On the other hand, Trembley reports twenty-nine cases of therapeutic abortion at Saranac, with only one questionable result. It should here be stated, however, that Trembley's cases were, at the time, in ideal surroundings.

assert that it is found on an average in 45 per cent. of tubercular pregnant women. This percentage is higher still when those cases are included, in which tubercle bacilli are found without definite tubercular changes in the tissues.

Norak and Ranzec found the changes in seven out of ten cases; Schlimpert in eight out of eleven (five of these being in the fourth or fifth month of gestation).

According to v. Bardleben, "the placenta is the *locus minoris resistentiæ*" and is especially well adapted for catching and harboring the tubercle bacilli. This is attested to by such men as Lippmann, Lüdke, Liebermeister, Schnitter, Jessen, Rabinowitsch, Forster, Bencke and Kürbitz. Upon the separation of the placenta, the intervillous spaces, the favorite resting places of the bacilli are then traumatized and the bacilli are cast anew into either adjacent structures or into the system at large. "The essential difference between the influence exercised upon active progressive pulmonary tuberculosis and upon the inactive type can be explained in the following way: In the one case the possibility and the probability are great, in the other, slight, of tubercle bacilli being carried through the blood stream to the placental site. In the severe cases a vicious circle is established.

These investigations, if proved to be entirely tenable (and in this remark there is no disrespect toward the authors of this work), will clear up the mystery that has surrounded this subject for so many years. It is most important that every case of tuberculosis and pregnancy be studied in this same patient and diligent manner; for if these findings are corroborated by further research we will be forced, even against our will, to resort to the more radical operative procedures in order to eliminate the uterine portion of the vicious circle.

The two procedures employed with this aim in view are hysterectomy and in the early months vaginal excision of the placental site. To all of us the latter operation is an entirely new procedure and will not, I think, appeal to many of us, despite the excellent results of its originator, v. Bardleben. The abdominal hysterectomy should, I think, be considered the operation of choice, for it is easier of execution and the abdominal route enables a more thorough inspection of the appendages in case these are likewise the seat of disease.

V. Bardleben in 112 active cases, found that



Fifty-two were aborted, with 36 per cent. mortality,

Eighteen were aborted, with hysterectomy, with 6 per cent. mortality,

Forty-two were aborted, with vaginal fundus excision with thirty-three living at the end of one year.

v. Bardleben's method of eliminating the danger zone "per vaginam" is carried out in the following steps, viz.: Long anterior colpotomy; dissection of the bladder from its uterine attachment; withdrawal of the fundus uteri and appendages through the colpotomy wound, ablation of tubes and of the fundus; suturing of the stump; covering of the stump with the bladder reflection of the peritoneum and closure of the colpotomy incision. He claims that both this operation and the abdominal hysterectomy have a striking effect upon the tuberculosis.

*Tuberculosis and Marriage.*—With our present knowledge of tuberculosis we must realize that it is a disease the ravages of which are widespread, that it is a disease which plays a large part in the depopulation of the nation (in 1910 in the United States the deaths alone were estimated to be 165,549; and this figure disregards all abortions or stillbirths directly or indirectly traceable to the tuberculosis of the mother), and that the ravages produced thereby are generally accentuated by pregnancy and labor. Moreover, we should realize to-night, if never before, the baneful effect of parental tuberculosis upon the offspring. What is our attitude to be in regard to the great problem of marriage and procreation? This attitude will be governed by our attitude toward the national questions of race betterment, of eugenics, and the welfare of the home.

Tubercular women should be advised not to marry until the process is fully arrested. The time-limit is usually placed at from one to three years after the pulmonary lesion is healed. This is most important, because (1) with one of the couple tubercular, the other may readily become so and (2) because conception will frequently take place and then we will have to face the serious problem of the pregnancy with its results. The time will come, I think, when no marriage license will be granted unless both of the contracting parties are in sound physical as well as mental, condition. If despite warnings, tubercular individuals *do* marry, they must be warned anew of the dangers of conception. Insistence must be placed upon hygienic living

under the best conditions available and just so long as a lesion is active in either husband or wife just so long should precautionary measures be adopted to avoid conception. Under such circumstances it is the physician's duty to see that this is carried out. Preventative treatment is after all the great mode of attack. These individuals will *not* be continent, they need rational management and education along these lines—not for selfish motives, to be sure, but for the welfare of the greatest number.

Conception in the active cases means, as we have seen, early death of the mother in a large percentage of cases or a child with hereditary predisposition or the necessity of more or less constant exposure to postnatal infection (Knopf).

Veit says (and this may be possible in Germany) that if a tubercular woman marries despite advice she should be forced to go to a sanitarium until cured. Jacobi has tersely put it: "You build asylums for the diseased neuropathics and drunkards; nurseries and schools for epileptics, cretins and idiots; sanatoria for incipient tuberculosis and refuges—all too few—for the dying consumptives." But, do we not begin at the wrong end? Consumptives, epileptics and idiots are allowed to propagate their own curse—both legitimately and illegitimately. The only protection for the family, for the nation, for mankind is the assurance of a healthy, uncontaminated progeny. Strict laws are required to accomplish this, laws that will be held in high disfavor by the syphilitic, the epileptic, the tubercular and the vicious.

Knopf believes in "vasectomy" for all tubercular male patients and salpingectomy for all tubercular female patients—married or not—who will submit to the operation. He would make this obligatory for all acutely active cases that insist on marriage, despite strong medical advice. This attitude of Knopf, is shared to-day by many clinicians who have studied the problem thoughtfully and who have broken away from the narrow-minded ways of the past.

Finally, we should remember that what has been said of tuberculosis alone applies with even greater force when this disease is associated with either syphilis or alcoholism. Fortunately nature, in her great wisdom, protects herself in a large measure in the presence of "mixed tuberculosis" and syphilis by causing a phenomenally high intrauterine death rate in the progeny of this "vile combination."

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## DELIVERY BY THE BREECH, WITH SPECIAL REFERENCE TO TECHNIC.<sup>1</sup>

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(With one illustration.)

BREECH delivery and its technic occupied very largely the minds and pens of obstetricians of the seventeenth, eighteenth, and first half of the nineteenth century. During this time, gradually increasing understanding of the mechanical problems, and of the variations occurring, resulted in many suggestions and directions with regard to the methods of handling these cases.

Mauriceau, Pinard, Levret, Champetier de Ribes, Smellie, Barnes, Veit, Gifford, Wigand, Braun, Puzos, Pugh, Kuvisch, Martin and a host of others wrote on the subject, and described methods whose name is legion for delivery of a woman with the child presenting by the breech.

After 1840, however, the interest aroused by Oliver Wendell Holmes, Semmelweis and Sir James Simpson in the relation of child-bed fever to surgical fever, by Pasteur in the bacterial origin of infections, by Lister and his successors in the application of this knowledge to surgery; the vast strides in general surgery made possible by asepsis and anesthesia; the advances in obstetric surgery brought about by these discoveries, has led the great majority of active and able workers in obstetrics to the newer and more fruitful fields.

To-day the majority of obstetric surgeons are devoting themselves to the fields of Cesarean section, extraperitoneal section, vaginal hysterotomy, pubiotomy, etc., until it seems that the more humble and purely obstetric procedures, such as forceps delivery, version, breech delivery with its complications, etc., were being relegated to the background; unfashionable operations, good enough for the nonexpert, but unworthy of serious

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

study by the more accomplished obstetric consultant and teacher.

Without for a moment wishing to detract from the value of the newer procedures, which are justly the pride of modern obstetrics, I do wish to protest against allowing the new, the brilliant and theatrical, to crowd entirely from our minds the study of such commonplace things as the indications for version, and the technic of breech delivery and extraction.

The man who develops clever technic in breech delivery will save the lives of more babies than he who can do a good abdominal Cesarean section.

A reduction in fetal mortality from 25 to 30 per cent. to 10 per cent. in these cases is not too much credit to the man who acquires skill in delivery of pelvic presentations.

The delivery of a breech in a multipara with normal pelvis, and relaxed soft parts, requires only sufficient wisdom, to keep one's hands off and leave the delivery to nature.

The art of masterly noninterference is as rare, however, as the art of being a good listener. It is only the master who has enough confidence in nature and in the sufficiency of his own resources, to await the slow development of an ordinary breech.

To correctly handle a case in a primipara with normal pelvis, requires more than ordinary skill. To successfully manage such a case in a primipara with contracted pelvis, requires the best surroundings, assistance, and perfected technic.

*Etiology.*—Any attempt to enumerate in detail all of the various possible factors in the production of breech presentation, is needless and never completed.

It is necessary, however, to know the underlying principles.

Any fault in size or shape of the pelvic inlet, any abnormality in size or shape of the head, any failure of the uterus to maintain the longitudinal axis of the fetus, in its normal relation to the pelvic inlet, may result in breech presentation.

*Frequency.*—The importance of the subject is indicated by the fact that in about one in every thirty labor cases, the breech presents.

*Prognosis.*—Universally accepted statistics give a fetal mortality rate in breech presentations, ranging from 30 per cent. in primipara to 10 per cent. in multipara in general practice.

In expert hands it is of course less. Expert handling involves not only good technic in actual delivery, but fore knowledge and preparation for probable complications.

The prognosis for the mother's life is slightly poorer than in vertex cases, and the outlook for her future health and well-being is considerably worse.

*Diagnosis.*—The diagnosis must include, presentation, position, size and shape of maternal pelvis, condition of soft parts with particular regard to dilatability of cervix and condition of perineum, and as accurate an estimation as possible of the size of the child.

Because the latter is difficult does not excuse its neglect. I was recently called to a woman in a breech case because the after-coming head could not be delivered; three quarts of hydrocephalic fluid were found. Her physician suspected nothing abnormal. Lack of examination, not lack of knowledge is responsible for the majority of such errors.

The breech not being engaged ordinarily, the length of the child from vertex to buttocks can usually be estimated. The head can be palpated and any unusual size discovered.

The most valuable procedure for estimation of relative size of head to pelvis, as used in cephalic cases, namely, crowding it into the pelvic brim according to Müller's method, is of course impossible here.

This renders careful estimation of the pelvic capacity more important if that were possible, than in vertex presentations where one has the option of other methods after the test of labor.

Here faulty judgment is only proven after delivery of the body, and when six or eight minutes only are left for delivery of the head.

Upon the accuracy of diagnosis not only of the presentation, but of all the factors likely to have a bearing on the ease, or the difficulty of delivery, the life of the child must often depend.

In routine examination, the hard round head above, the high position of the fetal heart, low situation of small parts, and high position of the presentation, are the most conspicuous features. Careful examination should enable any one to make the diagnosis.

*Management.*—There is neither space nor need at this time for repetition of all the details of management.

The author wishes, however, to bring out and emphasize certain points in which modern methods have enlarged our resources, as well as others which seem to him of special importance.

Management must begin with comprehensive diagnosis. The first problem is whether the presentation as found at the time of examination is probably the permanent one. Many cases pre-



senting as breech six weeks previous to labor undergo spontaneous version, between that time and the beginning of labor. The probability of this occurring diminishes steadily as the date of labor approaches. One must remember the patient's penchant for presenting facts favoring an early date for labor.

Here again, our favorite guide in doubtful cases, viz., lightening, will not be present. Much can be learned by accurate history taking, as well as from the condition of the cervix whose progressive softening and shortening indicates approaching labor. Spontaneous version rarely occurs during the last two weeks of pregnancy.

Having decided that the presentation is permanent unless changed artificially, we must next consider the advisability of external version.

In a multipara with normal pelvis, relaxed abdominal walls and vagina, and lax uterus, external version is usually easy and at the same time of little value.

Primiparity is good reason for attempting it, and a frequent cause of failure in execution.

Just minor pelvis in a primipara constitutes the strongest possible reason for avoiding breech delivery. It involves an extremely high fetal death-rate.

When external version seems strongly indicated, it should be tried under anesthesia to favor the maneuver, and close to labor to diminish risk of return of the malpresentation.

Nor can we consider this usually simple procedure as entirely without risk. The possibility of entanglement of the cord, with consequent disturbance of the fetal circulation, as well as the risk of disturbing the placental attachment by our manipulations, must be considered.

I recently nearly lost a patient from premature placental separation and consequent hemorrhage, apparently as the result of an attempted external version. Ordinarily, if the turning of the child seems to meet with unusual resistance we must desist from the attempt.

*Management of Labor.*—Unless one is quite sure of an easy delivery, he should make active preparations for complications. A competent assistant is the most important factor in preparation.

The advantage of having the patient in hospital care, and with trained assistants can hardly be overestimated.

Anesthesia at exactly the proper time, help in the technical

work of delivery, and above all else skilful suprapubic pressure may be elements which decide for or against the child's life.

I sometimes think I would have better results by turning over the vaginal portion of the delivery to an assistant, and myself conducting the suprapubic manipulations.

*Preparation of Patient.*—Because of the probability of extensive vaginal or even intrauterine manipulations particular attention should be paid to the technic of preparation.

Nothing but the most rigid supervision or the development of a true aseptic conscience by the nurse can make preparation of this field anything but a farce.

After watching the average nurse cleansing the anovulvar region, smearing colon bacilli in every direction, I am firmly convinced that no preparation is better than poor preparation of this field.

The anal and vulvar regions should be first cleansed separately, then washed with large quantities of soap and water from above downward, using fresh gauze or cotton wipes for each downward sweep of the hand to avoid smearing the vulva with anal bacteria.

Another point upon which more stress should be laid, is the danger during the vulvar washing of allowing dirty water from the vulva to run through the introitus into the vagina.

Even the operating room nurse accustomed to prepare for gynecological work is likely to permit this, because in her usual work she follows the external cleansing with a thorough scrubbing and flushing of the vagina. The danger lies in the fact that the usual obstetric preparation except for operative work, involves external scrubbing but no vaginal washing. Preparation with imperfect technic is an added risk rather than a safeguard to the patient.

At the first examination after labor has begun, we should investigate the direction of the uterine axis, any tendency to overhanging of the fundus or to excessive lateral deviation should be corrected with a properly padded binder, or with adhesive plaster strapping.

If the cervix or other soft parts promise to dilate slowly a Voorhees bag should be introduced into the vagina. This exerts counterpressure on the cervix, gives support to the finger-like pouch of the amniotic sac, and serves for partial dilatation of the perineum when it is withdrawn.

The prevention of early rupture of the amniotic sac is of considerable importance. It is more prone to early rupture in

breech than in vertex cases because of the finger-like shape of the projecting membranes. Its loss is of more importance than in normal presentations because, (a) of the longer time required for cervical dilatation, even under favorable conditions; (b) because of the greater danger of prolapsed cord; (c) because the breech makes a less perfect ball valve at the inlet than does the head; the liquor amnii drains away more steadily and completely.

Thus by the time the slow cervical dilatation is complete, we are the more likely to encounter spastic uterine contraction, which is here a special disadvantage, because we may at any time have occasion to introduce the hand into the uterine cavity. Care in making vaginal examinations; keeping the patient in the recumbent posture, and placing the bag especially in primipara, as a "point du appui" for the projecting membranous pouch, are all of aid in the preservation of the sac intact.

In the event of early amniotic rupture, if cervical dilatation promises to be unusually slow, the bag should be placed above the internal os, by the usual method for induction of labor.

Early rupture of the sac is more disastrous than in vertex cases, not only because of the absence from the cervix of nature's hydrostatic dilator, but because its usual substitute, the head, is not replaced by the breech, which enters the pelvic brim late.

Cervical dilatation must occur, therefore, if unaided artificially, by the slow process of cervical retraction to and over the presenting part.

The bag acts as a dilator, it also takes the place of the presenting part as a stimulus to vigorous uterine contractions. It should not be forgotten that in cases of pendulous abdomen, the German "*Hängebauch*," contrary to the usual rule, uterine contractions are more vigorous as well as more effective with the patient in the recumbent position, than when standing.

When such a patient stands not only is the direction of the uterine forces misplaced, but the overhanging of the fundus, allows the presenting part to lift up out of the cervix and thus the natural stimulus is again lost.

In the care of a hypersensitive nervous woman, with painful but ineffective first stage pains, after all mechanical factors have been attended to, the administration of 1/8 grain of morphine sulphate by hypodermic, or 25 to 30 grains of chlôral hydrate by rectum, frequently is of material aid in securing cervical dilatation.

There is no question that in a properly selected case, where the effectiveness of the uterine contractions is being reflexly

inhibited, dilatation goes on more rapidly and with less pain after the exhibition of one of these remedies.

Pituitrin is better reserved for the second and third stages, particularly in view of the probable exhaustion of its effects after one repetition.

Error is so frequently made in determining the extent of cervical dilatation that a word on this point seems in order.

One or two fingers applied to any one point of the cervical rim, simply pull it toward the pelvic wall of that side, and give the impression of more dilatation than actually exists.

The test should be made by trying its actual diameter with two or more fingers. Moreover, this should be done during the height of a pain when the circular form of the cervical rim is preserved.

Inasmuch as complete cervical dilatation is so necessary to success in these cases, more than usual care should be taken, that no error should be made with regard to its condition.

The cervix being completely dilated, if the pelvis and child are normal engagement will occur.

The bitrochanteric diameter is the master diameter of breech labor, and controls its mechanism.

In full breech before engagement the tibiosacral measurement is greater than the bitrochanteric, but it is compressible while the bitrochanteric is not, consequently in both complete and frank breech, the latter is the largest effective diameter.

In vertex delivery the movements of the occiput are used to describe the labor mechanism. It is at one end of the master diameter of cephalic presentation, the sagittal diameter.

In breech, the sacrum whose movements are used to define the position of the fetal pelvis, is not at one end of the master diameter, but at one end of a line perpendicular to the master diameter.

This is the occasion of much confusion in the mind of the obstetric novice, because as the anterior trochanter rotates under the pubes, the sacrum (used to describe the position) is rotating from an anterior oblique to a transverse position.

Normally, during the descent and delivery of the breech, the obstetrician's only duty is to watch the condition of mother and child, particularly the latter; bearing in mind, however, that the presence of meconium is not the danger signal that it is in cephalic cases.

We will suppose that the patient is a multipara with well-

relaxed outlet. She is placed across the bed as the breech approaches the outlet, the assistants are instructed as to their duties, and a waiting policy is pursued, or nothing more than some manual pressure exerted per abdomen during the pains.

The cord is examined as it appears, loosened by traction on the placental end, placed where least subject to pressure and its pulsations watched. As the scapulæ appear, the arms which are folded on the chest are delivered with a finger, then with the child astride one forearm, the finger is placed in the mouth or against the superior maxilla, diagonalization as well as flexion of the head assured; the assistant makes suprapubic pressure, the child's body being brought up between the thighs to a vertical position as final delivery of the head occurs.

As fast as the fetal parts appear they should be covered, and unnecessary manipulations of the baby should be avoided in order not to stimulate attempts at respiration. As soon as the mouth appears it should be swabbed free of mucus.

*Complications.*—A breech delivery such as described is practically a normal delivery. It is in foreseeing, preparing for, and meeting the numerous complications of pelvic presentation, that mastery of technic is of the utmost value.

Painstaking care in diagnosis is essential to correct treatment.

We will follow the complications in somewhat the order in which they are likely to occur.

*High Arrest of the Breech.*—This may result from, uterine inertia, primary or secondary; faulty direction of the uterine axis; contracted pelvis; large child; failure of cervical dilatation; pelvic tumor, etc. Extension of the legs in frank breech may cause moderately high arrest.

The treatment of faulty cervical dilatation and primary uterine inertia has already been given.

In high arrest with secondary inertia, sometimes faulty direction leads to overriding of the pubes by the anterior trochanter. This is often remedied by direct pressure on the trochanter externally.

Sometimes it is necessary in frank breech to bring down a leg.

If the liquor amnii has recently ruptured this will prove easy, but if the water has been drained away for some time, and spastic contraction is present, it is often difficult to introduce the hand far enough to seize the leg. Pinard's maneuver for this condition is as follows (Farabuef and Varnier):

Introduce the hand whose palm corresponds to the fetal

abdomen; pass the fingers along the belly of the fetus, while the thumb ascends behind the sacrum. Penetrate with the index- and middle fingers along the anterior thigh until the popliteal space is reached. Now press with the index-finger in this space thus overflexing the thigh, at the same time making pressure



FIG. 1.

on the ham-string muscles. The authors assure us that the foot will fall against the back of the hand.

My own experience is that when the uterus is so tightly contracted as to make the maneuver necessary, the hand cannot penetrate high enough to pass the knee and flex directly, and often space does not permit the leg to fall to the back of the hand.

When the Pinard maneuver fails I have several times succeeded by an additional maneuver which has the merit of simplicity once the Pinard grasp has been attained. The hand is already



grasping the fetal pelvis, thumb behind, palm in front, with the index-finger pressing the anterior thigh. If pressure in the popliteal space fails to bring the foot within reach, without changing the grasp, rotate the fetal body on its long axis, toward the side of the leg desired.

For Example: Pos. Sacro Left Ant.: The left thigh is to the right and anterior—rotate the anterior trochanter from the right toward the mother's left. (See diagram.)

If it were desired to flex the other leg, popliteal pressure with rotation in the opposite direction would effect the desired result.

The anterior thigh being brought down with the foot outside the vulva, traction posteriorly on it will aid in engaging the anterior trochanter.

Once the breech is thoroughly engaged, *i.e.*, both trochanters through the brim, it is possible if the thighs have not been extended as described above, to hook the fingers through the groins in addition to using pressure from above, to aid in its descent through the pelvis.

I believe this is preferable to the application of the forceps.

The fillet is occasionally of value, but is difficult to apply. Stout rubber tubing makes a good fillet.

Traction should of course be avoided when possible as it favors extension of the arms. When used it should be applied during uterine contraction and simultaneously with suprapubic pressure.

Unless the vaginal outlet has been thoroughly relaxed by previous labors, I am accustomed to supplement the bag distention of the perineum, by thorough manual stretching, with the index- and middle fingers of both hands; as complete perineal relaxation is essential to speedy release of the arms, when extended.

Not only does this preliminary stretching done at leisure, make possible more rapid lowering of the arms, but it aids in preventing the severe perineal lacerations so often occurring in primipara during that procedure.

*Release of the Extended Arms.*—The body being born to the scapula, it is necessary to be sure the arms are not extended. Two fingers suffice to bring them down if in normal position.

If not, they are extended alongside the head and their rapid release is indicated. Time is only wasted by attempting to deliver the head with the arms *in situ*. The maneuver usually described for lowering the arms is undoubtedly the best in most cases, *viz.*:

Begin with the posterior shoulder, swing the fetal body up toward the opposite maternal groin; pass the hand whose palm corresponds to the fetal back, over the dorsal surface of the scapula and upper arm, to above the elbow, then applying the fingers flatly, flex the child's forearm over its face. This arm released, grasp the fetal body (not legs) rotate the other shoulder posteriorly and repeat the process. One is always thankful for a thoroughly stretched perineum when attempting this procedure.

In spite of the usual success of this maneuver it occasionally happens that the arm although extended is nearer the face than the occiput. This being the case and the dorsal method of passing the hand proving difficult, because of lack of room, one can pass the opposite hand along the fetal abdomen (more yielding than the back) and often find more room beside the narrow face to insinuate the fingers and reach high up for the forearm than can be found dorsally.

If, one arm being released, the other is found back of the neck this is probably the result of artificial rotation used in releasing the first arm.

Locate the chin as for Mauriceau's maneuver. This will indicate at once whether there is already axial torsion of the neck and will show, whether the head and body of the child or the body, only, should be rotated in the attempt to release the arm.

Always rotate the shoulder involved toward the child's back, in other words untwine the arm from the neck by rotation of the child.

Preliminary pushing of the entire body a little upward and toward the mother's abdomen will loosen the head and arm at the brim and facilitate the procedure.

The arms being released, the head must be brought through the superior strait into the pelvic cavity.

Probably nowhere in obstetrics does complete knowledge of the mechanism bring more satisfactory results.

Champetier de Ribes has described a method for securing flexion and engagement of the head in simple flat pelvis.

The principles described by him are, however, equally effective in normal pelvis with large head, and consequently should be applied whenever the engagement of the head offers difficulties.

Flexion of the after-coming head, applied to the superior strait directly transversely, may be hindered by three prominences striking the pelvic brim, viz., (a) malar bone, (b) anterior parietal

protuberance, and (c) mastoid process. This is overcome by "diagonalization," *i.e.*, placing the sagittal diameter of the head in an oblique diameter of the superior strait. Now flex the head, and push it as far as possible to the side of the pelvis toward which the occiput points. The diagonalization releases the malar prominence and permits flexion; flexion brings a shorter cephalic axis into play at the brim, thus making space, at the occipital side, toward which the head is pushed. This brings the posterior parietal protuberance to one side of the promontory instead of directly against it.

This maneuver is accomplished by the French through vaginal manipulation of the fetal head.

Actually once the head is diagonalized, a properly trained assistant can accomplish the remainder by simply maintaining pressure over the anterior portion of the head and at the same time pushing it toward the occipital side of the pelvis.

Good assistance in this maneuver is essential.

Simply spreading out the hands and making pressure in the direction of the pelvic inlet, as so commonly advised falls far short of what can be done.

The head should be definitely flexed by pressure over its anterior portion; then while flexion is maintained, pushed toward its own occiput.

Another point in securing engagement especially if the pelvis is a little flat is the deliberate canting of the parietal eminences through the brim; first the posterior by traction as far forward as possible, then the anterior, by traction as far posteriorly as possible.

This corresponds in mechanical principle to the method advocated by Gillespie for forceps delivery in cephalic presentations in flat pelvis.

The value of the Walcher position in slightly increasing the antero-posterior diameter of the inlet should not be forgotten when attempting to engage the after-coming head.

The patient should be on a table so that traction in the line of the axis of the pelvic inlet may still be made.

With the patient in the Walcher position this direction is almost straight down.

In hospital practice the Walcher-Trendelenburg posture as described by Edgar is easily obtained and renders the principle of thigh pelvis extension easy to adopt, and permits convenient line of traction.

The head being through the superior strait may still be retained by an incompletely dilated cervix.

Of course the proper treatment of this is prophylactic.

Frequently, however, in spite of all our efforts, the incompletely dilated cervix grasps the neck and retains the head. If direct traction fails to release it three methods are open to us.

The cervix may often be brought into plain view by a little traction, its tense rim very evidently the only obstacle to completion of the delivery.

(a) The child's body may be held by an assistant who continues moderate traction while with the index- and middle fingers of both hands, the operator does rapid manual dilatation. This may succeed if only a little more room is needed, to allow the head to pass.

(b) If the cervix lacks considerable of complete dilatation, two or three fairly deep cuts with the scissors will permit extraction after which the incisions may be repaired. The incisions are best made with the cervix exposed to view.

(c) Instead of manual dilatation if one finds nearly enough room to pass the head, the child's body may be raised to a vertical position, and the forceps applied. A short Elliot or Simpson model is best for this purpose. The head should be in the pelvic cavity before their application. The contracted cervix does not hold the head at the brim but in the cavity.

Application of forceps beneath the child's body is better than above it, because it permits the blades to pass as they should along the mentooccipital diameter of the head. Flexion of the head is easily maintained by the forceps when thus applied.

This is in my judgment the only indication for the use of the forceps on the after-coming head.

The field of pubiotomy in vertex presentations has been decidedly restricted in the opinion of most obstetricians by the circumstance, that with hospital surroundings one can give his patient a considerable test of labor for engagement of the head and still be free to do a Cesarean section.

In breech cases this is of course impossible. So far as regards Cesarean section for contracted pelvis in breech delivery one must lose or save his baby according to his judgment at the beginning of labor. If section is to be done at all it must be done before any labor test or any accurate estimation of the head has been made.

In suitable cases, carefully selected, one can, however, prepare

for pubiotomy and place the saw; if reasonable efforts fail to pass the head, one minute will suffice to cut through the bone when the head can be delivered.

This is about the equivalent of allowing a test of labor in vertex cases.

Accurate diagnosis of the size and shape of the pelvis by an expert, is of course a prerequisite to this procedure. Complete cervical dilatation must also be assured or the child may be lost in spite of the pubic section.

Placing the saw, if section of the bone proves unnecessary should involve practically no risk for the mother.

In a pelvis whose true conjugate is 8 cm. or below, with average size baby, primary Cesarean is probably preferable.

*Prolapse of Cord in Breech.*—This complication is not extremely rare and means a great risk to the child. Replacing the cord if a long loop has prolapsed has not been successful in my hands. If the cervix is fully dilated, rapid extraction is indicated. If the cervix be only slightly open and reposition fails, two procedures offer. With a multipara with capacious pelvis, and relaxed soft parts, and providing the cervix can readily be brought down by traction, vaginal hysterotomy followed by immediate extraction is the best procedure.

In a primipara, or with a small pelvis, or with a cervix not readily brought down by traction, abdominal section is the rational procedure.

*Hemorrhage.*—The frequent prolongation of labor, producing uterine exhaustion increases the risk of postpartum hemorrhage from uterine inertia. Too frequently the fear of postpartum hemorrhage appeals to the practitioner as an indication for haste in the delivery of the placenta.

This leads to premature kneading, manipulation, and even Credé of the uterus with the result of precipitating the feared bleeding.

Bleeding from the site of uteroplacental attachment cannot take place until at least partial separation has occurred. An exhausted uterus whose placental attachment is intact as indicated by absence of existing hemorrhage, should be let alone.

Merely follow it down with the palm of the hand and observe its condition. A period of rest will restore its power as well as its ability to respond to stimulation. Kneading and manipulating an exhausted uterus if it accomplishes anything, simply means mechanically separating the placenta in part or com-

pletely from a relaxed uterus, unable to contract well in response to stimulation. Time for rest means recovery of tone, means increased response to stimulation, as well as that retraction of the uterine muscle fibers upon which we must depend for permanent control of postpartum bleeding.

The rapid emptying of the uterus, and the vigorous abdominal manipulation through the uterine wall, in breech extraction, both favor partial separation of the placenta before uterine retraction. Hemorrhage due to this cause may occur directly after delivery, and indicates immediate extraction of the placenta.

Deep cervical lacerations with consequent bleeding are much more common after a rapid extraction, than in ordinary labor. The differential diagnosis should be made before instituting treatment.

*Injuries to Mother and Child.*—After breech delivery because of the frequency of severe cervical laceration one is justified in exposing the cervix seeking lacerations, and repairing at once any damage found.

The numerous intrauterine manipulations may make justifiable in breech cases, another procedure that is unjustifiable in most deliveries, viz., the postpartum intrauterine hot saline douche.

I have seen all degrees of damage to the child in breech deliveries. Separation of the head from the body by unjustifiable force, cervical dislocation, demonstrated by palpation of the posterior pharyngeal wall, etc. This accident probably most frequently occurs, when traction is made on the twisted neck. Whenever traction is made to engage the head or pull it through the cervix, first locate the chin. It is the guide to the correct position of the shoulders during traction.

More common and likely to occur even to an expert operator, are fracture of clavicle, breaking of an arm, or injury to the leg during efforts at rapid delivery.

The frequency of injury to the child renders a critical examination necessary after breech delivery. Among the later results, to the fetus may be mentioned aspiration pneumonia, and convulsions or paralysis due to cerebral hemorrhage, or to traction on nerve trunks.



OBSERVATIONS ON THE SURGERY OF THE LIVER  
AND BILE PASSAGES.<sup>1</sup>

BY  
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(With one illustration.)

COMPARED with other portions of the body, the liver has been subjected to surgical attack infrequently, when its size, accessibility, and the frequency of disease of the organ are taken into consideration. The causes for this hesitancy upon the part of the profession to attack this organ lie in the friability of its tissue, the large blood supply, which has been difficult to control, the danger of pulmonary embolism after injury, the complicated function of the organ and its necessity to the life of the individual. All these conditions have tended to retard the development of surgery of the liver, professional energy being directed to those fields which were more easily accessible, and upon which operations were less dangerous to life.

Clinical and experimental studies upon this organ during the past decade have demonstrated that operations upon this tissue can be made without great risk, even large portions of the liver being removed without destroying life. Among the dangers to be avoided when considering surgery upon the liver are shock, hemorrhage, embolism, and infection. The functional capacity of that portion of the organ remaining after operation must be sufficient to supply the demands of the organism.

Of the conditions mentioned, we will first consider shock. The usual methods for the prevention of shock must be employed, although in the writer's experience in the absence of hemorrhage and with the exception of occasional respiratory interference during manipulation of the organ the amount of shock is not large. In both the experimental and clinical work of the writer it has seemed that shock in operations upon the liver is directly proportionate to the amount of blood lost, and of all the dangers in hepatic surgery hemorrhage is by far the most serious. Hitherto this has been the one chief difficulty to be met.

Here we have a very large friable organ supplied with a great number of blood-vessels passing through a thin delicate con-

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists, at Toledo, Ohio, September 17-19, 1912.

nective tissue, this making it likely for the slightest traction upon suture material to cause it to tear through the wound edges. A number of experiments have been carried out by different observers, both here and abroad, seeking to overcome this difficulty. The writer has been impressed with the fact that notwithstanding the great number of experiments made, he has been able to find only one mention of a plan of temporary control, which he has employed with success for some time. Almost the entire blood supply of the liver passes through the right border of the lesser omentum just anterior to the foramen of Winslow. Free bleeding from the organ during operation can be controlled by pressure of the thumb and finger or of a flexible protected clamp. Notwithstanding the fact that Prof. Dr. Garré (of Breslau) says that not much is to be expected from preventive hemostasis in the liver, I have been able to demonstrate both clinically and experimentally that by proper compression of the right border of the lesser omentum almost complete hemostasis during operation can be obtained. The simplicity of this plan of temporary control, the ease with which it can be applied, and the absence of practically all ill effect from its employment make it an ideal practice in these cases. It really is cause for surprise that it has not been generally adopted earlier. With this clamp applied the surgeon can carefully plan his further operative steps without any fear of embarrassing hemorrhage. The lines of operative incision into the liver can be carefully planned and the edges of the same cut in a beveled way as suggested by Auvray and Jacob Frank, which permits the cut edges to fall together without tension, thus favoring hemostasis and also avoiding a raw surface for peritoneal adhesions. It seems reasonable to conclude that the application of the temporary clamp is much superior to Langenbuch's proposal to produce preventive hemostasis by temporary ligation of the portal vein. Serious objection can be offered to the latter proceeding owing to the time necessary for early application of the ligation and the danger of injury to the vessel. Many plans have been proposed for the permanent control of hepatic hemorrhage. It was customary in the earlier operations upon this organ, especially where resection was done, to fix the liver in the abdominal wound, employ the actual cautery for hemostasis and pack the wound with gauze as an aid to permanent control. This method of necessity greatly increased the shock of the operation, left a large field for granu-

lation, and greatly prolonged the convalescence. Another method employed was the use of the elastic ligature of extraperitoneal treatment of the stump. In the writer's opinion, at the present time there is absolutely no indication for the extraperitoneal treatment of the stump of liver tissue.

Kousnetzoff and Pensky have shown that the vessels of fresh human livers are no less resistant than arteries and veins of similar caliber in other portions of the body, and that their walls are of sufficient firmness for isolated ligature. Auvray confirmed their results and demonstrated that hepatic vessels because of their elasticity could be drawn out from the cut surface of the liver to the extent of 1 centimeter—an additional evidence of the possibility of safe ligature. The blood pressure in the liver is never so high as in the main arterial circuit, and therefore coagulation should be more prompt here than in other portions of the body. In our animal experiments we have found this to be the fact. The method employed for hemostasis by Kousnetzoff and Pensky consists in applying ligatures *en masse* in a continuous row so that no free tissue remains between them. The threads when drawn taut crush the parenchyma but the vessels resist. This method has been modified by Auvray and both his plan and the one preceding seems to have followed that of Bonanna published in 1890.

In applying the sutures according to the methods above mentioned, the author has found the use of a large size (No. 3 or 4) catgut quite satisfactory, inserted by means of a blunt needle carrying a double thread. Even if the ligatures cut into the liver tissue slightly, the larger vessels hold and there will be no great amount of blood lost. It was formerly the custom to place gauze upon the liver tissue and tie the ligatures over it to prevent them cutting into the tissue. This necessarily called for drainage in the abdominal wound so that the gauze could be removed. We believe that this is no longer necessary. It is not necessary to put very great pressure upon the sutures in tying, in fact it is inadvisable. Prof. Dr. Garré prefers fine silk threads (No. 0000, Pearsall's) for direct ligature of the vessels and claims that he has found no disadvantage from their use. For the deep sutures which pass through the whole thickness of the liver, he prefers thick catgut (No. 2) because he considers thick firm sutures more correct, and because he has a general dislike to burying large silk threads.

With Garré, I believe the cautery to be unsafe in hemorrhage

from the large vessels, since it causes considerable loss of time to the operation and loss of blood to the patient. This method, as well as the steam spray of Snegirew and the hot-air method of Hollander, causes necrosis, necessitates leaving a raw surface, is followed by sloughing with the danger of embolism and secondary hemorrhage, therefore it is to be condemned.

Briefly, the operation as we believe it can be best performed, is made as follows:

Through an incision, abdominal or costoabdominal as indicated, the liver is brought into the field, the clamp applied to the vessels and the incision made into the liver in a beveled manner so that the flaps can readily fall together. All open vessels are tied with either very fine silk or catgut, preferably the latter. The beveled flaps can then be approximated by through sutures of large catgut, as described above. The edges of the wound are to be closed with a continuous suture of fine catgut. The clamp is allowed to remain a few minutes after the suturing is done, while the edges are compressed with hot gauze pads. It is then gradually loosened, the pads removed, and the abdominal incision closed without drainage. This seems to me to be a satisfactory and ideal method for the removal of liver tissue.

With reference to the functional capacity of the organ experimental investigations concerning this point have shown that in animals at least one-half of the entire structure of the liver has been removed without causing death. Dr. Ponfick, at the Nineteenth Congress of the German Society of Surgery, 1890, reported from physiological experiments that one-half of the liver can be removed in rabbits without causing any apparent change in the animal. A certain number of animals died after three-fourths of the liver had been removed. He noticed that the lost liver substance was little by little reproduced from the capsule. This he was able to demonstrate from the specimens. The reproduction was very rapid. In eight days after removal 80 per cent. of new tissue was found. Dr. Gluck reported to the same Congress the results of his work upon the subject as follows: "Ligature of the portal vein in the rabbit causes fatal convulsions. One-half of the liver may be removed without danger to the life of the animal, hence resection is justifiable. If both lobes of the organ be removed death follows in from four to five days."

In the management of contusions of the liver operation is only indicated by severe shock which is presumptive evidence of rupture of the liver or the gall-bladder. In the treatment of con-

tused wounds, rupturing the liver surface, with irregular ragged edges, there is great danger of embolism as well as hemorrhage. Therefore it is good practice to trim away ragged portions of the liver and employ the same methods of hemostasis that are used in incised wounds. Embolism can scarcely be avoided in some cases of contusion or gunshot wounds of the liver, since fragments of tissue may be almost immediately taken up into the large venous channels. In gunshot wounds I have found gauze packing to be efficient in the control of hemorrhage but have thought that it rendered an embolism more likely to occur, and I now employ it only when surrounded by rubber or guttapercha tissue, so that no tearing of the liver substance will occur upon its removal.

Multiple abscesses offer but little field for surgical interference with our present knowledge, although a few cases have been reported by Davis and others in which the liver has been freely incised and packed, opening as many abscesses as possible. A case reported by Treves recovered in which little was done beyond exploration. It would seem that most satisfactory results would be obtained in this class of cases by the employment of serum therapy. Solitary abscess, on the contrary, should be subjected to prompt incision. In my experience the two-stage operation is unnecessary since by careful packing the peritoneal cavity can be thoroughly protected. After evacuation of the contents of the abscess, dry sponging has given better satisfaction than irrigation. These large cavities are packed with gauze to control bleeding, and gauze is also used to wall off the peritoneal cavity. It can be removed after thirty-six to forty-eight hours and further drainage be obtained by large rubber tubes. A very important consideration in this connection is the direction of attack in these cases. Three general routes are offered to the surgeon, abdominal, transpleural and the combined abdominal and thoracic route. Most cases will be accessible to a well-planned abdominal operation, therefore the other methods should be employed only in exceptional cases.

*Hepaptosis.*—A large number of patients suffering from prolapse of the liver have Glenard's disease and should receive general treatment for that condition. A number of operations have been proposed for the relief of hepaptosis. The most satisfactory consists of shortening the suspensory ligaments, fastening the margin of the liver to the parietal peritoneum and attaching the gall-bladder to the upper angle of the wound. Depletion of the liver by catharsis is a useful aid in obtaining relief.

Tuberculosis is a rare affection of this organ and is usually part of a general miliary tuberculosis; rarely, however, a solitary focus exists resulting in a tuberculous abscess which may be relieved by incision. Mayo Robson reports such a case in which two years subsequent to operation the patient was in fine health. The treatment consists of incision, the removal of the fluid and caseating masses and the application of 1 to 500 solution of tincture of iodine or pure carbolic acid followed by alcohol. Drainage should be obtained as in a simple abscess.



FIG. 1.

The clinical aspect of actinomycosis is that of simple abscess. The diagnosis is somewhat difficult and may be confused with tuberculosis and syphilis, but may be made by finding the characteristic ray fungus in the discharge or tissue. The value of iodide of potassium in very large doses has been well established in these cases. Bevan recommends internal administration of cupric sulphate in doses of one-quarter to one-half grain three



times a day. He advises the irrigation of the abscess cavity with a 1 per cent. solution of the same drug.

Syphilitic tumor of the liver occurs with sufficient rarity to make the reports of isolated cases of considerable interest, and therein may be found the principal reason for recording the following:

On March 14, 1911, Mr. S., aged thirty-six, came to me with a very large growth in the upper abdomen, with the following history: About nine years ago he had a syphilitic genital sore for which he was treated a short time, *i.e.*, only until disappearance of the symptoms. He then remained comparatively well until eighteen months previous to consulting me, at which time he observed an unusual fulness in the abdomen. This was unaccompanied by either nausea or vomiting, and gave him little discomfort. No blood was observed in his stools, his bowels moved regularly, his urine remained normal, and during this time his appetite was unimpaired, in fact he had been a voracious eater.

Six months after the first appearance of this abdominal mass a celiotomy was performed in another city. The surgeon found a growth upon the left half of the liver, with a broad base, about 3 inches in diameter, and abandoned the operation believing the neoplasm to be cancerous. Following this operative intervention, growth of the mass has been steady, but notwithstanding the presence of the constantly enlarging neoplasm the general health of the patient had not deteriorated, on the contrary his weight has steadily increased.

On examination of the abdomen I found a tumor extending from the ensiform cartilage downward to the umbilicus, and laterally about 4 1/2 inches on each side of the median line. In the median line the mass gave to the abdomen a marked prominence, as will be observed by the illustration herewith presented. This mass moved with the liver in excursions of respiration, was dull on percussion and slightly nodular; pressure over the tumor caused the patient but little discomfort. He complained, however, of some interference with respiration. Laterally the mass showed slight mobility. Other portions of the abdomen seemed to be normal, no ascites being present, nor was there any marked enlargement of the superficial abdominal veins. Analysis of the urine showed this secretion to be normal.

The man presented none of the usual glandular enlargements of syphilis, but inspection of his buccal cavity showed a small ulcer on the mucosa just at the junction of the hard and soft palates—a typical syphilitic lesion.

Under the circumstances I considered this a rare and interesting case: Here was a man who had been operated upon one year previously and had been told that he could not live very long, that the neoplasm was probably malignant. A year later he

presented a much improved condition of general health notwithstanding the persistent increase in the size of the tumor.

Among the possible causes of such a condition might be mentioned hydatid cyst, benign tumor, sarcoma, carcinoma, syphilitic granuloma of the liver. It seemed justifiable to exclude the possibility of hydatid cyst by the absence of any history of tapeworm, and from the fact that the tumor was solid and showed no tendency whatever to fluctuation. The conclusion that the neoplasm was not a sarcoma was justified by the fact that a sarcoma growing to the size reached by this tumor would have caused marked anemia and cachexia, and certainly there would have appeared some interference with the functions of digestion and assimilation. The same may be said of carcinoma. A carcinoma reaching this size would almost certainly have been followed by marked glandular enlargement, which is of itself quite distinctive. It appeared, therefore, that the condition was either a benign tumor or syphilitic enlargement of the liver. It was unlikely that a benign, nonsyphilitic tumor would develop to the size reached by this mass within the time which had elapsed since the growth was first discovered.

I had never before seen a syphilitic growth of the liver reach this size. In my previous experience gummata were usually small and caused a general enlargement of the liver rather than a circumscribed tumor. Dr. R. Hayes Davis kindly made a Wassermann test for me in this case, which proved to be negative, and a similar report was made by Dr. Cyrus W. Field. This negative reaction, however, did not seem to contraindicate the possibility of this growth being syphilitic, since D. M. Coplin in an article appearing in the *Journal of the American Medical Association*, December 3, 1910, makes the statement that in three cases of tumor of the liver two showed positive and one negative Wassermann reaction. Therefore the negative reaction in this case was not a positive indication that the patient has not a syphilitic tumor of the liver.

This patient was presented to the Jefferson County (Kentucky) Medical Society about two weeks after his first visit to me, during which time he had been under active specific medication commencing immediately after the Wassermann test was made. At that time there seemed to be a slight diminution in size of the growth. This treatment has been continued for about twenty months, until now (December, 1912) the mass has gradually diminished until it has entirely disappeared.

*Treatment.*—In the treatment of syphilitic disease of the liver, the writer believes that operative interference is demanded only in rare instances, because the natural tendency of lesions of this character is to diminish and finally disappear following the administration of a vigorous antisyphilitic treatment. Therefore operation should only be advised after such a course of treatment has shown only moderate improvement and where final disappearance of the mass does not take place. At such time the neoplasm is largely composed of fibrous tissue and causes discomfort to the patient from its pressure effects alone. When such a condition presents, surgical interference is justifiable, and from the number of cases recorded, some sixteen as far as the writer has been able to note, operative results have been very good. The operation to be employed is the one previously described.

*Cirrhosis of the liver*, for a long time looked upon as a somewhat hopeless affection, has attained surgical importance since the suggestion of Talma that it might be relieved by establishing a collateral circulation through adhesions formed between the abdominal viscera and the parietes. Morrison, acting independently, had about the same time performed two operations and presented to the profession the first successful case of operation for this condition. Originally operation was proposed solely for the relief of the ascites incident to the hepatic disease, and for the most part this is at present looked upon as the indication for its employment in this affection. The direct mortality of the operation is at present not very high. Dr. H. H. Grant, who has made the most recent report upon this subject, has collected 144 cases, with a mortality of 11 per cent.; improvement 44 per cent., and of cures 11 per cent.

*Hydatid Cysts.*—This affection resulting in the presence of echinococcus in the liver is fortunately very rare in this country. Ferguson of Chicago has probably seen more of these cases than any other surgeon. The ideal method of treatment of this condition consists in enucleation of the cyst as recommended by Knowsley Thornton. After exposure of the liver and the protection of the abdominal contents by gauze packing, a trocar is inserted into the cyst and the fluid contents are evacuated. An incision is now carried through the substance of the liver, some operators employing a blunt instrument, or a cautery, for this purpose. The cut surfaces of the liver are protected as well as possible by gauze. The cyst walls are then separated from the pseudocyst by blunt dissection. Hemorrhage follow-

ing this procedure is not severe. When the cyst wall has been removed the cavity remaining should be obliterated by suturing with catgut, and the liver wound and that in the abdominal wall closed without drainage. Some operators deem it wise to employ drainage in every case, owing to the escape of bile-stained fluid from the liver wound, which sometimes occurs. Drainage should always be employed when the operator is unable to remove the entire pseudocyst wall. We believe this operation to be the best one for relief of this condition, although some prefer to make the operation in two stages, attempting to protect the peritoneal cavity prior to incision into the liver.

*Hepatic Tumors.*—It has only been within the last two decades that tumors of the liver have been considered at all accessible to surgical attack. It is only a very small percentage of tumors affecting this organ which are primary growths. The pathology of these tumors is not well understood, in part because of their rarity and to some extent due to the difficulty of diagnosis. Clinically they may be divided into benign and malignant growths. Of the benign growths angiomas are probably more frequent than any other. It is sometimes accompanied by varicosity of the vessels in the falciform ligament. The writer some years ago met a most interesting case of this character. These angiomas usually do not reach a large size, have a cavernous network of vessels and belong to the class known as plexiform angiomas. They rarely cause much disturbance and in many instances they are only observed at operation done for some other condition.

Other benign tumors of the liver, adenomata, fibroma, endothelioma and myoma deserve mention. Lipomata occur so rarely, there is some doubt about their existence. Adenomata may be single or multiple. The single tumors may be derived from the liver cells, from the intrahepatic bile ducts, or from adrenal rests. Some of the adenomata developing from the bile ducts may become cystic and reach considerable size.

Dr. W. W. Keen reports the removal of a cystic adenoma of the bile ducts which he removed from the right margin of the liver in 1892. The patient made a good recovery and five months later remained in perfect health. In 1899 he reported three personal cases and collected from the literature seventy-four cases which had been performed up to that date, sixty-three of which recovered and eleven died, a mortality of 14.9 per cent. Cause of death in the fatal cases has been shock,

hemorrhage, and exhaustion eight; septicemia two, and pulmonary embolism one.

Prof. E. Triconi in 1895 reports the case of a man, aged twenty-seven, in which he extirpated the entire left lobe of the liver for adenoma originating in the bile ducts. After resection of the ensiform cartilage and division of the coronary and triangular ligaments, as well as the rectus muscle, that portion of the viscus containing the tumor was drawn without the abdominal wound which was sutured. The neoplasm was compressed by means of elastic tubing and metal loop, and necrosis brought about. On the eighteenth day, after the application of a segmented suture above the ligature, the tumor was separated with the knife; cicatrization occurred on the ninety-sixth day.

Primary malignant disease of the liver is of very rare occurrence, while, according to DaCosta, secondary carcinoma and sarcoma form 96 per cent. of all liver tumors. These secondary tumors are in almost every instance inoperable from the onset. The only form of secondary carcinoma which is amenable to excision is that class of cases which follows gall-bladder disease where beginning cancer of the gall-bladder has extended into the liver tissue, and here, too, only early recognition and prompt excision offers the patient any hope. In the experience of the writer even primary forms of carcinoma of the liver are not at all hopeful for a permanent cure, yet he believes where the growth is seen early and has not attained too great size excision is justifiable. The writer has operated several times upon carcinoma of the liver accompanying cancer of the gall-bladder, without immediate mortality. A benign tumor which is single and accessible should always be subjected to removal.

THE ATHERTON, FOURTH AND CHESTNUT STREETS.

## NEPHRECTOMY FOR POLYCYSTIC CONDITION OF THE KIDNEY.<sup>1</sup>

BY  
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CYSTIC degeneration of the kidney is a rare condition and has apparently been less interesting to clinicians than to the pathologists.

A number of cases have been reported at birth and during

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists, at Toledo, Ohio, September 17-19, 1912.

infancy but the majority of cases are found between the ages of forty and fifty years. A case eighty-eight years old has been recorded. It rarely ever occurs between infancy and the age of twenty-one.

It is slightly more common in women than in men.

In 98 per cent. of the cases both kidneys are affected. When unilateral, the left kidney is more frequently the one involved.

Heredity seems to play some part in its etiology; Beck has found it in two sisters; Lund in a man whose mother had had the same trouble; Virchow reported a family in which four of six children were affected. Sanger reports a family in which the first, fourth, seventh, tenth and thirteenth children had a bilateral congenital cystic condition of the kidneys, and the other children were normal.

The inherited tendency seems to be toward a faulty development which is not confined to the kidney. We find exstrophy of the bladder, epispadias, atresia and absence of the ureter, vagina, bladder, etc., hare-lip, spina bifida and absence of the extremities.

Moschovitz, Lejars and others found that there was frequently a degeneration of the liver also.

Four theories are given to explain the pathogenesis of cystic degeneration in the adult kidney: (I) That the process is a new growth; (II) that it is the result of inflammation (Virchow) and sclerosis of the tissues between the tubules, the convoluted tubules being the ones most involved; (III) that the process is a malformation and must therefore be congenital; (IV) some hold that it is the result both of a malformation and a tumor formation.

Garceau thinks "The most plausible explanation seems to be that the disease may originate in consequence of embryonic malformation, and that subsequent neoplastic formation takes place."

Lund describes the cysts as follows: The whole organ, both cortex and medulla, is studded with cysts of various sizes, from that of a pin head to that of a mandarin orange. The surface is knobby with cysts of different size and color, brown, red, green, translucent, like windows bossed with varicolored glass making a pathologic specimen of truly remarkable and imposing appearance. The walls of the cysts are thin, vascular, and the larger ones show folds on their inner surface which are the remains of the walls of the smaller cysts, which have coalesced to form them.

The fluid consists of urine, since in it are found urinary constituents, such as uric and hippuric acid, calcic oxalate, cystin,



leucin and tyrosin, but in the larger cysts this fluid is considerably diluted (probably by serum which has transuded through the walls), albuminous, and contains blood pigment, fat and cholesterol in varying quantities, so that the color of the cysts may be red, brown, or yellow, and the fluid in them more or less cloudy. Between the cysts are often found more or less extensive areas of normal renal parenchyma; other cysts are separated merely by fibrous tissue.

*Symptoms.*—It may exist for months or even years without any symptoms. Where both kidneys are involved to such an extent that very little normal kidney tissue remains, the patient remains in perfect health until suddenly he develops uremia and in a short time dies. Arteriosclerosis often causes death by cerebral hemorrhage. Three stages are described by Millward: The first stage, when both kidneys become enlarged, may last for several years and only be discovered by accident. Pain is the chief symptom in the second stage. This may be of a dull aching character felt in the lumbar region or abdomen and may radiate to the iliac region, testes or lower limbs. Renal colic due to passage of blood clots down the ureters may be mistaken for calculus. Some of the pain may be due to hemorrhage into the cysts.

The amount of urine is usually increased with a low specific gravity with a trace of albumin. Blood is usually found microscopically. Hematuria may occur every few months or years and is usually due to some trauma in the lumbar region. This stage may last for years. The third stage is short with symptoms due to decreased elimination of urea, severe headaches, dyspnea, drowsiness, convulsions and coma. The skin becomes yellow and bronzed. There is marked emaciation and loss of strength. Some cases have a hectic fever and death may be due to anuria and uremia. Ascites, diarrhea, cardiac failure, pulmonary edema, etc., have been noted.

*Operative Treatment.*—Curtis and Kammerer devised an operation by which the larger cysts are opened and drained and the cyst walls are sutured to the deep fascia.

Nephrectomy should never be done without first exploring to find the condition of the other kidney and then practically only for severe hemorrhage.

Roswell Park did a nephrectomy on a child two years old that recovered and died a few years later from the same trouble in the opposite kidney.

Albarran and Imbert report thirty-four nephrectomies with twenty-five recoveries; of these fifteen were traced—two for seven years, one for six years, four for three years, three for two years, four for one year.

Sieber reports sixty-two nephrectomies; twenty died soon after operation and the others were traced—two for seven years, one for six years, one for five years, four for three years, two for two and one-half years, the others for from five to fourteen months.

*Case Report.*—Mr. H., thirty-four years of age, was first seen with Dr. W. T. Berry on February 11, 1911, and the following history was taken: His father died at the age of sixty-six of uremia following enlargement of the prostate and his mother at fifty-two of organic heart trouble. His family history was otherwise negative. He had typhoid fever when six years old; malaria for one and a half years when fifteen years of age; has had three attacks of grippe in the past ten years. Five years ago he noticed that the vision in his left eye was almost gone; noticed dark red objects swimming across the field of vision. He was examined by Dr. Bruns of New Orleans who told him that he had had a retinal hemorrhage (this was probably the beginning of the renal trouble or was the first symptom to attract attention). This gradually cleared up and the field of vision on the outer side became fairly clear but on the inner side remained poor. His urine at this time was negative, having been examined by Dr. Shands of Jackson, Mississippi.

He has had periodic attacks of pain on the right side for the past four years; has had some gastric disturbance. Kidney hemorrhage: In August, 1909, after having been out seining all day in the hot sun, noticed some blood in the urine at 6 P. M. and throughout the night; at 3 A. M. the same night he had a severe attack of pain over the region of the right kidney radiating down to the bladder, which was only relieved by several hypos of morphia. The urine cleared up in twenty-four hours but he was very sore over this region for several days.

The second attack which came on five days ago followed a long ride in a buggy over rough country roads. He had considerable discomfort over the region of the lower pole of the kidney for several days before the blood appeared in the urine. There were some clots but he had no sharp pains. A bimanual examination shows the kidney to be quite tender. The urine voided twenty-four hours later shows some albumin and a few red blood cells; white blood cells, 14,000. X-ray shows a slight shadow beneath McBurney's point. A week later the hemorrhage began again and was quite profuse the following day.

On palpation the right kidney seems considerably enlarged and quite tender. We were unable to make a cystoscopic examination on account of a deep seated stricture.

He was removed to the hospital and operated on the following

day, under gas-oxygen anesthesia. An incision was made over the appendix, which was in a state of chronic inflammation and was removed. The left kidney was enlarged but was smooth and seemed to be in a healthy condition. The right kidney was at least three times the size of a normal kidney and was hard and nodular. After closing the incision over the appendix he was turned over and the right kidney was exposed through the flank. There were numerous cysts of various sizes and colors and apparently great destruction of kidney substance. After consultation with his brother and several other surgeons who were present we decided to remove the kidney. The kidney when laid open showed the typical picture of cystic degeneration with the greater part of the kidney substance destroyed.

He made a rapid recovery. The urine cleared up in a few days and was about normal in quantity.

He has gained considerably in weight and is apparently in perfect health and has a good color, twenty-three months after operation.

His urine has been examined from time to time since the operation and is free from blood and albumin.

## THE TOXEMIAS OF PREGNANCY.<sup>1</sup>

BY

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At the outset, I would disclaim any originality in the treatment of this most interesting topic; my chief excuse for bringing it to the attention of this society being the obscurity in its etiology and pathology, and its comparative frequency. No more serious and apparently hopeless clinical pictures could present themselves to the practitioner than a typical attack of puerperal eclampsia or a case of hyperemesis gravidarum, two of the most distressing manifestations of the indefinite clinical condition, the subject of this paper.

The study of the toxemias of pregnancy has been ineffectual in bringing about a unanimity of opinion as to their etiology though a number of attractive theories have been advanced. To show the diversity of opinion in regard to the etiology of these toxemias, the following quotations are made from the writings of well-known authors:

Dorland, in his text-book mentions the following theories: Lever's theory, the pressure or mechanical theory; Halbertsma's

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

theory, a modification of the pressure theory, he attributing the condition to the compression of the ureters by the gravid uterus; Tyler Smith's theory, that the albuminuria was a direct outcome of the sympathetic irritation of the kidneys; Gubler's theory, that it is a superalbuminosis; Blanc's specific theory, which has later been positively disproved; Frerich's theory, that the condition is one of ammonemia, which is the existence in the blood of ammonium carbonate resulting from decomposition of the urea circulating therein; Spiegelberg's theory, that it is a vasomotor spasm the result of renal inadequacy of acute origin, arising from reflex irritation of the uterine nerves.

Hirst claims, "the etiology is still obscure. All that can be said at present is that eclampsia is the result of the retention in the body of substances that should have been disposed of by the excretory organs, namely, the kidneys, but which, owing to the insufficiency of these organs, remain stored up in the body." Playfair states, "We are hardly yet in a position to explain its true pathology with certainty." Parvin says, "the generally accepted view of eclampsia, is that it is produced by auto-toxemia. What these poisons are and what their origin, are questions still unanswered." Warren states, "that many theories have been suggested for its explanation none of which seems to satisfy all of the requirements." Cazeaux and Tarnier claim, "that an irritation of the nerves of the uterus, vagina, bladder, rectum or stomach may become the determining cause of general convulsions."

Edgar classes acute yellow atrophy of the liver, pernicious vomiting of pregnancy, and eclampsia under a general etiology, toxemia, which he defines as "a state of the blood and metabolism arising from the hepatic insufficiency to which the pregnant woman is strongly predisposed."

Grandin and Jarmin give the following etiology, "whatever the prime etiological factor, a secondary factor is uremia, or rather urinemia. In short the preferable descriptive term to use for this condition is toxemia."

Garrigues states that "many theories have been advanced to explain the outbreak of eclampsia, but so far none of them covers all cases."

The important cause, according to Wright, "is the accumulation of toxins within the body, the liver, intestines and kidneys, being chiefly at fault."

Jewett writes, "the last word has by no means been spoken

on this question, but this much may be stated with positiveness, that eclampsia does not always depend on albuminuria and kidney change, and further, that albuminuria does not constantly accompany the convulsions."

Williams concludes as follows: "The clinical history and anatomical findings afford presumptive evidence that the disease is due to the circulation of some poisonous substance in the blood which gives rise to thrombosis in many of the smaller vessels, with consequent degenerative and necrotic changes in the various organs. But at the same time we are absolutely ignorant concerning the nature of the offending substance."

Reynolds and Newell claim that "eclampsia is the result of a general toxemia, and is not due entirely to renal insufficiency as was formerly supposed."

Davis describes the toxemia of pregnancy as a condition of autointoxication, with poisons alkaloidal in nature secreted within the patient's body, and probably by the fetus also.

A number of the later authorities have classified the toxemia of early pregnancy, viz., nausea, vomiting and salivation, with that state known as the preeclamptic condition, and the typical convulsive seizures in the latter weeks of pregnancy. This directs attention to the pathologic condition present in the liver and kidneys as having a direct bearing upon the toxemias in both extremes of pregnancy.

Chief among the advocates of the hepatic rôle in the etiology is Von Frierichs. Shicekle(1) has made an exhaustive study of the liver in connection with eclampsia with and without convulsions, with control experiments on pregnant mice. He concludes that normal pregnancy greatly disturbs the function of the liver. Among the postmortem changes found in the liver of the pregnant are various forms of necrosis, fatty degeneration of and fatty deposit in the liver cells, parenchymatous degeneration, hemorrhages and fatty deposits.

Jurgens and Small(2) describe the hepatic lesions as essentially a thrombosis of the capillaries with hemorrhages and degeneration of the cells at the periphery of the lobule. In pernicious vomiting, the pathology is a fatty degeneration and necrosis of the cells at the center, extending toward the periphery.

In this article by Ingraham from which the above is quoted, reference is made to the impaired glycogenic function of the liver in the toxemias of pregnancy. He suggests the administration of 20 to 50 grams of cane sugar, and when the assimilation is

below 1 gram per kilogram of body weight the prognosis is grave and the termination of pregnancy should at once be accomplished.

Although there is a decided unanimity of opinion that the nausea and vomiting in the early weeks of pregnancy, in all its phases and degrees, and the preeclamptic and eclamptic condition of the later weeks, are manifestations of a toxemia, there is just as decided a difference of opinion as to the identity of the toxins which cause these symptoms. Pinard(3) believes that the toxic element is not the same throughout the entire period of pregnancy. In the earlier months it affects the vomiting center, there is hypotension and an increase in the frequency of the heart's action, while in the latter period of pregnancy the central nervous system becomes gradually involved, with excessive pulse tension and eclamptic convulsions.

The hematotoxic theory of eclampsia presents some attractive features. Murray(4) reports three cases dying of eclampsia showing marked signs of a toxin attacking the blood. The part which the placenta plays in forming albuminoid materials and allowing their passage from one circulation to the other has not been satisfactorily explained nor has it been determined whether these albuminous materials are fetal or syncytial in origin. However, from the fact that on death of the fetus and delivery, the toxic symptoms are usually relieved, would point to the fetal origin. Another argument advanced by Hirst, in support of the fetal origin, is that in hydatidiform mole with its very large growth of syncytium, eclampsia is very rare. In Schenck's experiments(5) it was possible to demonstrate toxins in the placenta and to neutralize these toxins by sera.

The organs more or less constantly subject to pathologic changes in the toxemias of pregnancy are the kidneys. The changes in them are not always uniform, but a fatty degeneration is the one constant change. The other degenerations of the kidney which are present in all profound toxic conditions are present in the pregnancy kidney, but usually more profound in the latter condition.

Schmid(6) (*Zeit. f. Geb. u. Gyn.*, Bd. lxxix, H. 1, 1911) gives the following summary of the pathological processes found in the toxemias of pregnancy: "the typical changes in the internal organs in eclampsia are degenerative processes in the parenchyma of the kidneys and especially in the epithelium of the tubules, with production of albumin and fat, and local degenerative necrosis; in the liver, hemorrhagic necrosis with thrombosis of the



capillaries and the inter- and intralobular vessels; hemorrhage and softening in the brain, membranes, and central ganglia, with thrombosis of the small vessels; albuminous and fatty changes in the heart muscle and hemorrhage and necrosis of these tissues."

Hirst very correctly calls attention to the fact that kidneys may be diseased and be functionally sufficient, and others anatomically perfect yet insufficient functionally when called upon to do double duty. It is a fact, however, that a diseased kidney cannot be expected to remain functionally perfect for very long, especially if additional toxin is constantly acting upon it.

Williams' ammonia coefficient theory as the cause of eclampsia has many attractive points and a number of warm supporters. Frigeysi(7) and others do not agree that the ammonia coefficient above 10 per cent. indicates toxemia and disturbance of the liver, but ascribes this condition to starvation, the same as shown by the presence of acetone.

Hoatling and Groat(8) have recently contributed practical articles on this special phase of the subject and lay great stress upon the urinary findings in the toxemias of pregnancy. Hoatling states that the proper examination of the urine will show whether it is nontoxic, whether a case of vomiting is reflex, neurotic or toxic; if a patient in the preeclamptic condition has the toxemic or nephritic variety or whether a case of eclampsia is toxic or nephritic. As to the nitrogenous elements in the urine, the urea nitrogen should be about 75 per cent. and the ammonia nitrogen from 3 to 5 per cent. Groat describes the method of estimating ammonia nitrogen as follows: "only such apparatus as is usually possessed for urine examination and gastric contents analysis, viz., beakers, test-tubes, evaporating dishes, a buret or pipet graduated in tenths of a cubic centimeter, a 1 c.c. and a 10 c.c. pipet, and decinormal sodium hydroxide. Twenty cubic centimeters of urine are measured into a good sized evaporating dish and diluted with water until nearly colorless. A teaspoonful of crystallized potassium oxalate is added, and a few drops of a saturated alcoholic solution of phenolphthalein as an indicator. The whole is carefully neutralized with sodium hydroxide solution until the faint pink of the indicator appears. Five cubic centimeters of commercial formalin which has been neutralized with the sodium hydroxide until it too, with the indicator, just shows pink is added. The color is discharged because the formaldehyde unites with the ammonia to form hexamethylene tetramine,

releasing the acids with which the ammonia was combined. Now tenth-normal sodium hydroxide is run in slowly from a buret or graduated pipet until the pink tint reappears. The number of cubic centimeters of sodium hydroxide used when multiplied by 0.0014 gives the grams of nitrogen in the form of ammonia in the 20 c.c. of urine; and multiplied by 50, the grams in 1000 c.c."

Personally I have not carried out this apparently most important diagnostic test as I should have done nor have I learned by inquiry of many in this section who are doing so. Not only should the ordinary chemical tests of the urine of the pregnant woman exhibiting symptoms of toxemia be made, viz., tests for albumin, sugar, and microscopical examination for renal derivatives, but an estimate should be made of the total nitrogen and ammonia nitrogen output. When the ammonia nitrogen reaches 10 per cent. or over, with or without albumin, it should be considered a serious condition and the indications for a termination of the pregnancy carefully weighed.

The result of the study of metabolism as related especially to the ductless glands, would lead to the belief that there is some connection between the urinary changes found in pernicious vomiting and the secretion of the thyroid gland. Ingraham(9) in view of these studies urges a consideration of the use of the glandular extracts in the therapy of the toxemia of early pregnancy.

Another valuable agent in recognizing the development of the toxemias of pregnancy is by the use of one of the various instruments for estimating the blood pressure. Much valuable data has been collected on this subject, Green(10) of Boston in a recent article has referred to the work of Frank and Heimann,(11) Slemons and Goldsborough(12) and Bailey(13) who agree upon the importance of studying the blood pressure as an index of the toxemias of pregnancy. Green further classifies the toxemias of pregnancy as follows, with the blood-pressure index in each.

Type.	Blood Pressure.	
	Before delivery.	After delivery.
A. Eclampsia:		
1. Impending.	Moderate.	Falling.
2. Acute.	High.	Falling.
3. Fulminating.	Extreme.	Rising.
4. Postpartum.	?	Moderate.
B. Chronic nephritis.	Moderate.	Rising or constant.
C. Hypermesis.	Moderate.	Constant.

He has added two groups to this classification, as follows:

1. Postpartum eclampsia, which is a condition of cumulative toxemia in which the resistance of the patient's central nervous system prevents outbreak of symptoms till after labor.

2. Cases of pernicious vomiting, with fairly normal blood pressure, in which the condition progresses to a fatal result, with rising ammonia coefficient, unless the uterus is emptied.

*Vomiting.*—Three distinct types of vomiting are generally recognized; reflex, neurotic and toxic.

Abnormalities of the generative tract are given as the causes of the reflex type, such as retroversion of the uterus, ovarian cysts, severe cervical tears and erosions.

The advocates of the neurotic form claim that all forms of nausea and vomiting are due to a neurosis and can be corrected by hypnosis or suggestion. While it is true that pregnancy exerts a peculiar influence upon the nervous system, it cannot be borne out in fact that pernicious vomiting with its distinct pathology can be a neurotic manifestation.

It is the last or toxic form with which we are most concerned. The pathology and etiology of this form has already been dealt with.

The vomiting of pregnancy can perhaps still be divided clinically into nausea without vomiting, accompanied by more or less salivation; nausea and vomiting of one but not all meals ingested, and the serious and distressing condition of hyperemesis gravidarum.

It is to the latter condition that I would especially call your attention. In this form the patient, after a period of nausea and vomiting of the second degree, during which there is an increasing prostration out of proportion to the stomach disturbance, begins vomiting not only the nourishment taken, but in between these attacks, with much retching and accompanying prostration. There is a gradual rise of temperature, considerably increased pulse rate with hypotension and profound prostration. The breath has a decided acetone odor, the tongue is dry and the picture is that of impending dissolution. Several cases of this kind have been reported in this city with a fatal ending.

I have under my observation at the present time a patient pregnant for the third time. Each pregnancy has been associated with severe nausea and vomiting, the first developing rapidly into the pernicious form, necessitating a premature delivery at nine or ten weeks. The late Dr. Wm. Bailey was the consultant in this case, and I can recall with what reluctance he consented

to the evacuation of the uterus, even when the patient had gone almost beyond hope of relief from any measure. In the second pregnancy the nausea was not nearly so severe, but by confinement to bed for nearly three months, and most careful watching and feeding she was able to complete gestation. She is now pregnant since January 27 and this time, as before, the nausea began almost at the time of conception. A peculiar feature each time has been that the mornings are the best time of the day for her, the most severe vomiting occurring after 5 o'clock P. M.

A recent writer<sup>(14)</sup> calls attention to the beneficial effects of the artificial Nauheim baths in pernicious vomiting. If all the effects mentioned as due to this treatment are present, it should be of service in this condition, viz., increased oxidation, increased excretion of urine, decrease in arterial tension, slowing of pulse rate, dilation of superficial vessels, stimulation of nervous system and trophic centers of spinal cord, with relief of physical and mental depression.

The term preeclamptic stage is used to represent that condition in which the patient exhibits the symptoms of faulty metabolism and deficient elimination, and may occur at any time during pregnancy, rarely before midterm, and most frequently from the seventh month to full term. Zweifel records one case at the third month.

The patient in the preeclamptic stage generally presents a typical picture. The usual condition of constipation is more marked, the stomach, which for some weeks has probably been functioning properly, is easily disturbed; there is a loss of appetite; nausea may recur; the urine is scanty, though the patient usually believes that because of frequent urination from pressure irritation of the neck of the bladder, a proper amount is being passed; albumin is usually found, with some of the renal derivatives; the ammonia nitrogen is increased; the least exertion is accompanied with shortness of breath and palpitation; headache is more or less constant; there may or may not be edema of the ankles; and as the toxemia deepens, a disturbance of vision is usually present, temporary blindness, blurred vision, etc.

The profession, as a rule, is careless in an examination of the urine of pregnant women, and the preeclamptic and active eclamptic stages are frequently encountered without a previous knowledge of the condition. Patients too often neglect the specific directions in regard to the urine and are themselves responsible for their condition because of failure to report these

symptoms to their physician. This is especially true of primiparae who look upon any abnormality as due to the condition of pregnancy and to be expected. To obviate this difficulty, I have had printed a booklet which I have entitled: "Hints to Expectant Mothers," embodying in it many suggestions looking to the welfare of the patient during pregnancy. This brochure is given each patient whom I am engaged to attend in confinement. Waiting patients are requested to send a sample of urine on the first and fifteenth of each month, and in this way they are more easily examined and kept track of. If these instructions are carefully carried out, many cases of eclampsia could be prevented, because the preeclamptic stage would be more quickly and easily recognized and appropriate remedial measures promptly instituted.

While it is true that eclampsia may occur in cases which have not presented an albuminuria, and conversely there may be an albuminuria present throughout the latter months of pregnancy without eclampsia; I would emphasize the fact that the presence of albuminuria alone is a danger signal which cannot be looked upon lightly, and is one of the most valuable evidences we have of the preeclamptic stage. Brown (*Jour. Amer. Med. Assn.*), from a record of 54,010 births gathered from statistics and personal observation, thinks that albuminuria is present in fully 80 per cent. of normal pregnancies. It must also be taken into account that a fatal puerperal toxemia may occur in which convulsions and coma are entirely absent. Schmid reports a fatal case in which there was only a slight albuminuria and edema of the ankles, in which the autopsy showed the characteristic pathologic changes in the liver, kidneys and brain.

There is no need in a paper of this scope to refer in detail to the symptoms of eclampsia, but there is one which has been prominent in three of the most recent cases under my observation, and that is amblyopia and amaurosis. Dimness of vision, hemianopia, or complete blindness may be present as one of the first symptoms of the preeclamptic stage, and is one of the most positive of the indications for the termination of pregnancy. The prognosis for a return of vision if this is done is very good, the reverse is true if palliative treatment is undertaken. One of the cases which I saw in consultation at the sixth month of gestation presented a dimness of vision rapidly developing into complete blindness after a few days of altitudinal hemianopia, associated with increasing amount of albumin, and number of renal deriva-

tives in the urine. After premature delivery the sight gradually returned and at the end of six weeks was very good indeed, though the urinary findings were far from normal. A question as to the duration of the amaurosis will certainly be asked, and this is not answered in most text-books. One of my cases totally blind after delivery, had complete return of vision in two weeks; in another blind before delivery, the sight was perfect in about ten days. There were severe convulsions in both cases.

The prophylactic treatment of the toxemias of pregnancy is most important. If patients would but report their condition as soon as they recognized it themselves much more could be done by a regulation of diet, exercise, habits, etc., looking toward proper elimination and lessened chance for autointoxication. Troublesome vomiting of pregnancy—all reflex causes removed or remedied—can best be treated with the patient in bed, elimination, total rest of the stomach, for a shorter or longer period, and, if necessary, rectal feeding, during this time. Lavage of the stomach may be very beneficial. The very number of remedies suggested for this condition is evidence enough that no drug answers the requirements and I seldom use any but calomel. Rest in bed, careful liquid feeding in small quantities, will give the best results. The suggestion already made to give the glandular extracts should be borne in mind as offering some benefit. With the presence of pernicious vomiting, accompanied by an increase in the ammonia nitrogen coefficient, pregnancy should be terminated at once. The line of safety may be easily overstepped.

With the appearance of any of the symptoms of the preeclamptic stage, the patient should be put at once upon a strict milk diet. This is entirely feasible, in all cases. The treatment should be begun with calomel, no other drug offering the same advantages or results. It should be given in doses of 1 grain, repeated at hourly intervals for four or five doses. After elimination has been produced the calomel should be repeated occasionally in smaller doses. If the edema is at all marked, this should be followed by a saline, repeated until free watery catharsis is obtained. Daily examination of the urine should be made, and with improvement in this, a more liberal diet can be allowed. Free use of water is quite essential. Should the symptoms grow progressively worse and eclampsia supervene, the treatment can be considered under the following heads:

1. The treatment of the patient while in convulsions.



2. Elimination.
3. Evacuation of the contents of the uterus in the quickest manner possible consistent with maintaining the integrity of the soft parts of the mother.
4. The after-care of the patient.

The means at hand for the control of the convulsions, are chloroform inhalations, veratrum viridi, chloral hydrate, and morphine.

It has been conclusively proved that chloroform causes changes in the liver identical with those found in eclampsia and pernicious vomiting. Ewing and Bevan have shown this by animal experimentation. It is also apt to more seriously damage already crippled kidneys. One instinctively turns to chloroform for the purpose of controlling the convulsions, but with this knowledge it should be used most cautiously and carefully, if at all.

Veratrum viridi is an agent of which much has been written, for and against. If given in selected cases, in the plethoric patient with a full, bounding, rapid pulse it may be an agent of much benefit. It should be given hypodermatically in an initial dose of 20 minims and this repeated at hourly or half hourly intervals of 10 minims at a dose until the pulse has been reduced in frequency, from 120 or more to 50 or 60.

Chloral hydrate is a valuable remedy, and can be administered and absorbed, per rectum, before catharsis is obtained. It should be given in much larger doses than is generally advocated, an initial dose, by this route, of not less than 30 grains, repeated in an hour in a 15-grain dose. This can be combined with the bromides with favorable results.

Much has been said about the use of morphine to control the convulsions and it has many advocates. The routine treatment of this condition at the Rotunda Hospital of Dublin, almost to the exclusion of other remedies is to give heroic doses of morphine. Half a grain is given hypodermatically, and repeated if necessary, in 1/4-grain doses every two hours, up to a total of 2 grains in twenty-four hours (*Journal of Obstetrics and Gynecology of British Empire*, February, 1906.) Under this treatment it is claimed a mortality of only 16.9 per cent. is had. In the light of the pathological changes in the kidneys as a result of pregnancy and in spite of these statistics, I believe the use of morphine to be fraught with great danger, and should be used with extreme caution. Attempts should be made at once to obtain elimination. To this end an initial dose of calomel, of 2 to 4 grains should be

given dry, on the tongue, followed, as soon as the patient can swallow, by Epsom salts in a saturated solution. This should be repeated at half hourly or hourly intervals until free watery catharsis is obtained. If swallowing is prevented by the state of unconsciousness, advantage should be taken of the smallness of the dose necessary by giving a drop or two of *oleum tigllii*. This can be administered with a few drops of olive oil upon the tongue in a medicine dropper and repeated in half an hour or an hour for its effect. If the unconsciousness continues between convulsions, excellent results may sometimes be had in securing elimination, by enveloping the patient in hot packs repeated at frequent intervals until free perspiration is obtained. *Pilocarpine*, in my judgment, is a dangerous remedy as it has too great a tendency to produce a fatal pulmonary edema which is one of the complications most to be feared. Whipping up the kidney is a measure to be used with great caution, hence, diuretics are not to be considered at this stage.

Venesection can be used in certain cases with decided benefit. In one of my cases 16 ounces of blood were removed with excellent results. If the blood pressure is increased it can be lessened most effectually by venesection. *Potocki*(15) advocates blood letting of 600 to 1000 c.c. even in the preeclamptic condition, claiming for it more uniformly good results than by any other single method.

If the convulsions are frequent and severe, it must be borne in mind that it is very necessary to protect the patient's tongue from being bitten during the seizures. I have seen quite severe lacerations of this organ by neglect of this measure.

*Accouchement forcé* in my judgment is indicated in many cases in the preeclamptic condition, and in every case of eclampsia. It should be performed as quickly as is consistent with the integrity of the soft parts of the mother. It is one of the clearest indications in the treatment, the only consideration being the choice of method. If the convulsions are very infrequent, consciousness returning promptly, the slower methods of induction of premature labor, as by the use of the bougie inserted between the membranes and uterine wall, *Barnes'* bags or the *Champetier de Ribe's* bag, or the injection of glycerine between the membranes and the uterine wall may be employed. The use of the *Champetier de Ribe's* bag will probably yield the best results. Rapid dilatation by the *Bossi dilator* is not advisable because of damage done the cervix.

If the convulsions are so frequent and severe as to make it necessary to deliver promptly, the method advocated by Dr. Philander A. Harris of New Jersey will give the best results. The patient is anesthetized and under strict aseptic precautions, the cervix is gradually dilated first by the introduction of one finger in the os then one by one the remaining fingers are inserted, until the cervix yields entirely. If the eclamptic attack occurs before the cervix has softened enough to permit the introduction of one finger, the deep cervical incisions of Dührssen can be employed and the delivery then easily accomplished.

Dürrsen writes as follows in regard to his operation (*Surgery, Gynecology and Obstetrics*, March, 1906): "In all cases in which faulty dilatation has to do only with the portio vaginalis, and where a real danger is present for the mother or the child, it is the author's opinion that it is at the present day the duty of the obstetrician who is skilful and antiseptic, to dilate the cervix completely by means of from two to six deep incisions reaching to the sides of the vagina and to deliver the child. By means of this method we can conduct labor even with a completely closed cervix and even (*i.e.*, in severe eclampsia) in the last weeks of pregnancy."

During the Harris method of dilatation uterine contractions are generally stimulated, and if a vertex presentation is encountered, they may be sufficient to cause engagement of the head, in which event forceps can be applied.

If engagement of the head has not taken place a choice must be made between podalic version and high forceps, and I unhesitatingly recommend a podalic version in preference to the high forceps operation. The latter is an operation which is safe in the hands of only the most expert. It is most difficult to perform and is done at great risk both to mother and child. When done the axis traction forceps should be used. The steps of a version need not be considered here. It should be remembered, however, that the prognosis for the life of the child born of an eclamptic mother is very grave at best; added to this, the additional risk of a breech presentation, the prognosis is much worse, and these facts should be carefully presented to the husband or some member of the family before it is performed.

During the third stage of the labor, much good will result from allowing the escape of considerable blood before maintaining a firm contraction of the uterus.

It has perhaps been noticed that nothing has been said in regard to the use of salt solution. This is a valuable remedy in

all toxic cases, but in this condition the heart's action is greatly exaggerated, the arterial tension is very high and an increased volume of blood is not to be desired. After venesection or the uterine bleeding referred to, the saline could be used with benefit, by hypodermoclysis or direct venous transfusion.

In the light of recent metabolic studies as regards the function of the thyroid gland, the administration of thyroid extract, as advocated by Ewing and Nicholson, may prove of decided benefit. Freund(16) has recommended horse serum in eclampsia, claiming that it fulfilled all theoretical needs that were attributed to human sera and the different extracts.

The after-care of the patient consists in maintaining the strict milk diet; free elimination by the bowel; frequent warm sponge baths; occasional use of calomel, for its beneficial action upon the kidney as well as the bowel; and a prolonged puerperium. It is usually best to feed the baby artificially, if it survives, as the puerperium must necessarily be prolonged, and the milk will be tardy in making its appearance, if at all. Free use of water should be maintained throughout the convalescence.

Mention should also be made of the delivery under gas and oxygen or ether anesthesia by Cesarean section, by the high incision as has been advocated by Peterson of Ann Arbor and Davis, of New York. The rapidity and simplicity of this operation and its freedom from shock recommend it for serious consideration in eclampsia, especially in primiparæ with rigid cervixes.

No attempt has been made in this paper to make a detailed report of cases. In a paper on eclampsia read before the Louisville Academy of Medicine in 1906, seven cases were reported with two deaths. Since then I have had under observation five cases with one death. The latter was in a colored hospital patient, admitted in profound stupor, who died in spite of all remedial measures. The remainder recovered perfectly.

To summarize the treatment:

1. Control the convulsions by the following remedies, veratrum viridi, chloral hydrate or morphine.
2. Obtain elimination by free catharsis, by administration of calomel, and salines, or ol. tigllii if swallowing is not possible; diaphoresis by hot packs.
3. Empty the uterus, employing slow methods if possible, if not, by use of rapid manual dilatation and delivery by version or forceps.

4. Bleeding and saline infusion by hypodermoclysis or direct venous transfusion.

5. Maintenance of elimination, strict milk diet and free use of water by the mouth.

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- 705 SOUTH THIRD STREET.

## OBSERVATIONS ON THE PRESERVATION AND REPAIR OF THE FEMALE PERINEUM.<sup>1</sup>

BY

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"The woman about to become a mother should be the object of trembling care and sympathy, wherever she bears her burden or stretches her aching limbs. God forbid that any member of the profession to which she trusts her life, doubly precious at that eventful period, should hazard it negligently, unadvisedly, or selfishly."  
—*Oliver Wendell Holmes.*

It might be well to preface this paper with the assurance that it is not my intention to enter into any classic discussion of the anatomy and surgery of the female perineum, nor to discuss any one or more methods of technic in common use by obstetricians.

As many Fellows of this society are teachers, and all are prominent in the profession, it seems to me that you are in position to do much good to womankind by impressing upon our col-

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

leagues the importance of the preservation and repair of the perineum of the parturient woman. I wish therefore to emphasize a few points which have seemed to me to be of sufficient interest and importance to warrant their presentation for your approval.

In ordinary obstetric practice, laceration of the perineum is in all probability the commonest accident. Williams says, that occasionally you meet with physicians who state that they have delivered several thousand women with one or two or without a single tear of the perineum. Such statements are always erroneous and indicate that the physician has not inspected the parts after labor, and designates as torn only those cases in which the vagina and rectum have been converted into a cloaca, to the existence of which his attention will surely be called by the patient. Davis says, that any man who says that he never lacerated a perineum at childbirth, has either had no obstetric practice, or he does not look for lacerations, or he is not careful with the truth.

Left to nature, lacerations of the perineum are the rule, and any escape under such conditions are the exceptions. On the other hand, in most cases conducted by skilled accoucheurs there is no tear, or the laceration is only through the fourchette. Thus it is evident that a great deal can be done by the careful obstetrician to prevent lacerations of the perineum.

It is not necessary to impress the average obstetrician with the importance of preserving the perineum, but I feel that the very great importance of careful repair of these lacerations is not always appreciated by many of our friends, both in the profession and among the laity.

One has to spend but a few years in a modern hospital to fully appreciate the long train of woes that follows a neglected laceration; or worse yet, a bungling repair. The most appreciative patients seen at the hospital are those who, having dragged themselves along, suffering from backache, headache, prolapse, loss of bowel control, cystitis, piles, miserable in every way, are sent home strongly rebuilt and as near to the condition that nature intended they should be in, as the present state of our surgical skill can make them.

Many conditions favor the laceration of the perineum. Among these may be mentioned the following: The readiness of the tissues to tear and their indisposition to stretch. This we cannot alter. It is sometimes recommended to lubricate the perineum, but in what way the application of grease to the epithelium can alter the structure of the muscles and fascia has



never been explained to me. Herman says, there is no evidence that lubrication does good, but only the opinion of those who use it to the effect that sometimes a perineum is saved which would have been torn if it had not been anointed. It seems to do as much good as the water did when the mother of Achille anointed his heel. As it is impossible to foretell the occurrence or extent of a perineal rupture, the opinion is not based upon substantial ground. Williams says, that greasing and fomenting the perineum is without value. In my own opinion, it is a filthy habit and the danger of infection is one that should be considered.

Next, the size of the child's head; or a much ossified head; or large shoulders. If a live child is to be delivered we cannot alter this. Of course, a faulty position can be corrected if labor has not progressed too far. At this point, I wish to emphasize especially the danger of laceration at the time the shoulders are born. I believe that a very large percentage of tears occur during the passage of the shoulders over the perineum. The accoucheur has skilfully guided the head over the perineum and then feeling safe he disregards the shoulders with the resulting laceration.

The speed with which the child comes through the passage is of tremendous importance and is, in my opinion, the keynote of this discussion. This is the one factor which you can and should control. In fact, the only way to prevent laceration of the perineum is in regulating this by taking care that the perineum is not too suddenly stretched, but is given time to dilate.

In ordinary cases there are three points to attend to in preserving the perineum. First, the presenting part should be allowed to distend the perineum as much as possible. Second, the head should be maintained in an attitude of flexion when delivered. Third, the child should be allowed to escape slowly through the vulvar opening.

One frequently hears the accoucheur blame the consistency of the tissues in excusing himself for a laceration. Many tears could be prevented by retarding the labor by the use of narcotics and anesthetics, thereby allowing more distention of the perineum. Some contend that the use of opiates is injurious to the child. This may be true if these agents are injudiciously used but in the doses commonly used I have yet to find a single case where I regretted the application of such relaxing agents at the time of labor. I do not wish to appear to be sanctioning the use of certain widely advertised nostrums. I can see no reason for

replacing our time-tried friend, morphin, with preparations whose merits are best known to those who manufacture them at a large profit. I am satisfied that the reckless use of hyoscin in obstetric practice, has done more mischief than many of us imagine, and that many practitioners have been lulled into false safety by believing the glowing advertisements of these nostrums.

Apart from the conditions referred to, laceration of the perineum frequently occurs through faulty manual or instrumental delivery. In difficult deliveries, the accoucheur, in his anxiety to extract the child tears the perineum with his hand or forceps. We have all seen many cases in which the perineum has been destroyed before the head has come down upon the pelvic floor. Of course, if the life of the mother is in danger, delay is not advised. But these emergencies do not arise as often as some would have us believe. I believe that if a little more patience were used fully one-half of the forceps deliveries would not seem necessary. Too many physicians are willing to sacrifice the future comfort and possibly the life of a woman in order that they may arrive at the theater in good time. If a practitioner is too busy to give the time necessary for a proper delivery, he should not take the case. He should turn the case over to some man who has the time and is willing to devote it to the particular case under his care. Thus he will be conferring a favor upon his brother practitioner; he will be doing his duty by the woman and the child and he will be setting a good and much needed example to the young men just arriving at their medical majority. I wish that some of these "hurry-up" accoucheurs would read the story of Dr. Rast and conjure over his experiences in the tenements of New York.

It has been interesting to me to note the small percentage of perineal tears occurring in women delivered in our hospital and in other good hospitals. There is a good and sufficient reason for this. The patient is never without attendance; the resident physician or staff etherizer is always within call for anesthesia no matter at what hour they may be needed; the chief nurses are graduates of lying-in hospitals; the nurses are trained in the best methods of preserving the perineum and all necessary help is at hand. If the attending physician is called away, or if labor is very slow and he does not care to sit around for several hours, he need not hurry delivery with the application of forceps but

can go to bed or out of the hospital, knowing that the nurses in attendance will use the most approved methods to delay delivery and allow the perineum to distend fully. If perchance the accoucheur does not return in time to deliver the woman, there is always some member of the staff to take his place. Then if a laceration does occur, everything is ready for a careful aseptic repair and the after-treatment is all that could be desired.

The consulting obstetrician seldom applies forceps at the first visit. The first visit is many times the last visit because after advising delay the child is born without the use of forceps. I generally advise them to wait, even if the family and friends are not satisfied, and if after a time consistent with the number of hours already consumed and the condition of the patient and the child, delivery does not take place normally, they call me again and there is always time to apply instruments. When forceps are used the patient should always be under the influence of an anesthetic so that the parts may be thoroughly relaxed.

Various plans have been devised to lessen the tension of the perineum. One is to press the sides of the perineum toward the center. Try to do this and your fingers will slip over the skin without altering the position in the least. The same applies to the scheme of pressing the hinder part of the perineum forward.

Putting the finger into the rectum to press the anus forward is claimed by most writers to be reprehensible. They claim that not only does it soil the hand so that it is out of service when most needed for insertion into the birth canal, but there is danger of wounding the rectum. They also claim that it does no good, for the perineum must, whatever its position, dilate enough to allow the greatest circumference of the head to pass. I am not in accord with the above views. I believe that at times great good can be accomplished by inserting the finger into the rectum and increasing the flexion of the head, thereby allowing the occiput to slip over the perineum, between pains, with the least amount of damage.

Pressure directly upon the perineum was the plan recommended by the older accoucheurs; and in so far as it retarded the too rapid advancement of the head, it may have done good. Herman says that it could have done good in no other way.

The beginner is to be warned from attempting to protect the

perineum by any method that aims at stripping it back over the presenting part. Such a procedure is useless, even if carried out successfully, and often while attempting it the head will suddenly shoot past the hand and cause severe laceration.

Many obstetricians, when rupture seems imminent, advise the practise of episiotomy. Kerr claims that it is difficult to decide when to perform this operation. He incises the lateral walls if the posterior commissure is torn before the head has escaped to any extent. He thinks well of the operation but Williams considers it of little avail and Herman does not mention it in his new book.

In the Vienna hospitals, episiotomy is extensively practised. I have seen the midwives perform this operation many times and with most beautiful results. It is truly wonderful to see these patient attendants, slowly but surely, delivering woman after woman without even a small tear of the perineum. It is not entirely a matter of skill. It is a matter of patience, and careful application of all the little tricks of technic, and the labor is justified by the results. The glory of American surgery is known everywhere but I am sure that we can learn much from the slow but sure Vienna midwife.

The text-books divide lacerations of the perineum into three arbitrary degrees. The first is a slight tear of the fourchette. The second degree includes those lacerations extending to the anal margin. Those of the third degree include tears through the sphincter ani and into the bowel. The first two degrees are said to be incomplete. Those of the third degree are complete.

We now come to the repair of the lacerations of the perineum. This brings up the question—*when* and *how*—and perhaps, I should add by whom.

Circumstances and the opinions of various teachers have caused the time for repair to be divided into the immediate, mediate, and late periods.

I was taught that no worse crime could be committed than to allow the repair to wait a while. By waiting a while, I do not mean to delay until the patient has arrived upon the "Golden Shore," but within the bounds of the three periods mentioned above. But since I have gleaned some sense from the experience of others and myself, I am at times inclined to believe (with

apologies to the Bard of Avon) that he who delivers and runs away may let the woman live to fight another day.

Too many practitioners think that the repair of a perineal laceration consists merely in the sewing of the skin. We must impress upon them that there is a great deal more to this procedure and teach them that it is important to repair the wounds of the anterior and posterior vaginal walls, and thus avoid infection, rectocele, cystocele, and many other complications. The instruments needed for such repair should be found in the armamentarium of every well-equipped practitioner.

Small tears of the first degree can be repaired at once or within a few hours with a few catgut stitches. This procedure can be carried out amid almost any surroundings, without help, and the results will be generally good. The results are not always good, even in hospital practice, as the tissues may be too badly bruised to permit healing by first intention.

Referring to tears extending down to the anal margin and up into the posterior wall of the vagina, circumstances must alter cases. Given a good home, with a good nurse and good light; assurance of good after-care, such as cleansing of the stitches after urination and defecation; under such circumstances I would say repair at once with catgut and silkworm-gut stitches. I cannot agree with Williams and Kerr that you will do no harm and may do some good. I have seen much harm done and so have you.

Imagine yourself in a dirty hovel with no competent assistance; no one to whom you can trust the after-care of the patient; poor light; the patient obliged to arise from the bed to attend to the calls of nature; the tissues bruised and lacerated; under such circumstances I should say that it is love's labor lost. You have wasted time and energy and material and you can generally rest assured that the results will be nil. And you cannot say that you have not opened up new avenues of infection along the stitches. If the above be true of incomplete lacerations, how much more must it be true of complete lacerations of the perineum? Why would it not be better to wait until a proper interval shall have elapsed and then take the patient to some good hospital, and there, under rigid asepsis, have the laceration successfully repaired?

Many authorities do not favor immediate repair. Some advise waiting a week; others a month; some six months or a year.

Amid proper hygienic surroundings I would advise immediate repair. If such conditions did not obtain, I would prefer the mediate or late repair. If in the city and I can have the patient removed to the hospital within a few hours or days after delivery, I like to operate at that time. After a week has elapsed I prefer the late operation, at a period six months or a year later. Referring to cases for late operation, I allow these to wait until cicatrization of the perineal and vaginal wounds has taken place.

I need not impress upon you that I am not in favor of practitioners treating these old lacerations and their complications and sequellæ in their offices. I cannot see how tampons, caustics and douches can aid in restoring torn muscles and fasciæ and replacing a prolapsed womb. And furthermore it is not honest.

In these late cases the operation should always be performed in a hospital, and always by a surgeon who has the skill requisite for such work. A bungling repair is worse than none at all as the patient is not relieved and a new mass of scar tissue is added.

There are innumerable methods for the repair of the perineum, but as there are so many good ones, and as each surgeon has his own best methods, you will not be interested in a discussion of this phase of the subject at this time. Personally, I am in the habit of using a technic which embraces the good parts of the Emmett and Tait or flap-splitting operation. The method avails little if the operator be deficient in skill.

I am sure that the after-care of an operation for the repair of a lacerated perineum is equally as important as the operation itself. I have the nurse cleanse the stitches every three or four hours, or after urination and defecation, with an antiseptic solution. Vaginal discharge is not allowed to collect upon the stitches. The patient is kept upon her back at least fourteen days and is not allowed to arise for passage of urine or feces. The bowels are not opened for at least four or five days and when once opened they are kept in good condition. The body is carefully looked after lest bedsores appear. The stitches are removed at the end of two weeks but there is no harm done if they are left for a few days longer. Now, could this be done anywhere but in a hospital or luxurious home? Many practitioners have failed to secure the desired results because after performing a beautiful



operation, they have failed to provide the proper postoperative care of the wound. It is for this reason that I have so frequently referred to the hospital technic. I do not wish to tell the practitioner that the surgeon in the city hospital is the only person capable of successfully carrying out the surgical treatment of lacerations of the female perineum, but I do feel that it is only in modern hospitals that the advantages obtain for the proper carrying out of these procedures.

In conclusion, I trust that I have achieved the purpose of this paper as stated in the introduction, namely, to bring out a few good points, the appreciation of which may save some perineums or make good those already injured.

I feel that the members of this society are in position to spread the gospel among the general profession and teach them not to handle these cases "negligently, unadvisedly, or selfishly."

*References:* Schauta; Wertheim; Bumm; Hirst; Williams; Kerr; Herman; Baldwin; Davis; etc.

238 EAST STATE STREET.

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## IN MEMORIAM.

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WILLIAM JAMES ASDALE, M. D.,<sup>1</sup>

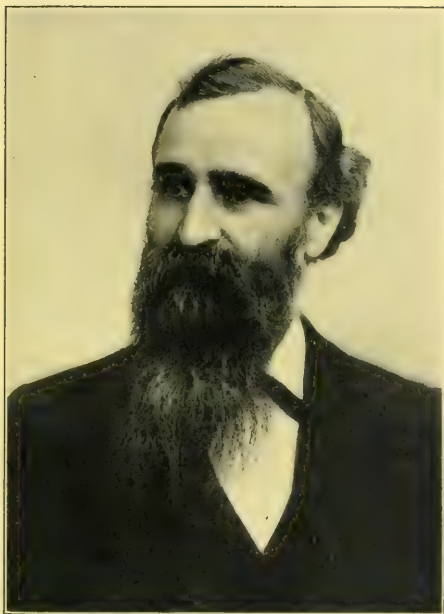
BY

X. O. WERDER M. D.

(With plate.)

DR. WILLIAM J. ASDALE, of Pittsburgh, died May 19, 1912, after a protracted and painful illness at Patterson Heights, near Beaver Falls, a suburb of Pittsburgh, having spent the last three years of his life at this place. He had been a member of the American Association of Obstetricians and Gynecologists since the year 1890, and was therefore one of the oldest members of this Association. A very active Fellow in the earlier years of the Association, and a regular attendant upon its meetings, he had in more recent years rarely been seen at its annual gatherings, and few of the younger members had therefore an opportunity of knowing him personally. Up to his last illness he

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



DR. WILLIAM J. ASDALE.




retained, however, an active interest in the affairs of the Association and its Fellows, and frequently commented upon the papers and discussions presented at the meetings, which he evidently had studied with much care, in the Journals and "Transactions."

Dr. Asdale was a native of Pennsylvania, having been born at Clinton, Allegheny Co., August 25, 1842. After receiving a thorough classical education he entered the Rush Medical College in Chicago, from which he graduated in the year 1866.

He immediately began practising medicine in Pittsburgh with much success and soon became one of the pioneers in gynecology, having a wide reputation and with a large following. He served on the staff of the West Penn Hospital, and on the organization of the West Penn Medical College, he occupied the chair of diseases of women for a number of years. After his resignation many years ago, he retained his connection with the college in the capacity of Secretary of the Board of Trustees until three years ago, when the college became affiliated with the University of Pittsburgh, as its medical department. In his position as Secretary of the Board of Trustees, he made himself almost indispensable to the medical school, devoting much of his time and a great deal of energy and enthusiasm to his duties, which required considerable executive ability and which were by no means light or free from care. Though always a busy man, he gave up some of his time to the public affairs of his home city, serving in the City Council and on the School Board.

Dr. Asdale was a man of strong personality, being very pronounced in his views, which at times were antagonistic to his best personal interests and were sometimes the means of alienating some of his professional colleagues. In spite of his peculiarities he was admired by those who knew him intimately for his many sterling qualities, his truly noble and Christian character and his fine professional and literary attainments. He was diffident and slow in forming friendships, but as a friend he was staunch and loyal, and always ready to give assistance and valuable advice.

Dr. Asdale was twice married. His second wife, who was Jessie B. Reeves, survives him. His only son is Dr. W. J. Asdale, practising in the State of Wyoming.



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**IN MEMORIAM.**

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**DR. EDWIN SAUNDERS RICKETTS.<sup>1</sup>**

BY

CHARLES L. BONIFIELD, M. D.

DR. EDWIN SAUNDERS RICKETTS was born at Procterville, Lawrence Co., Ohio, May 18, 1853. His father was Dr. Girard Robinson Ricketts, for many years a practitioner of medicine and an honor to his profession. His mother was Rachel McLaughlin Ricketts. His ancestry were French Huguenots. He graduated at Marshall College, Huntington, W. Va., in 1871 and received the degree of M. D. from Miami Medical College in Cincinnati in 1877.

He at once located in Portsmouth, Ohio, where he was soon engaged in active practice. He was one of the first practitioners in that locality to use chloroform in obstetrics. After ten years of creditable work as a general practitioner, the proper foundation for every specialist, he decided to limit his work to gynecology and abdominal surgery.

Lawson Tait was the star in the medical world at that time, toward which all eyes were turned, and Dr. Ricketts went to England to be his student. The impression on Dr. Ricketts by this great man was indelible, he showed it in his work and nothing gave him greater pleasure than to talk of Tait as a man and a surgeon, to those who had not seen him.

While abroad he visited Berlin, Paris, Rome, Florence and Naples. He saw work by Martin and Budat.

In 1888 he located in Cincinnati and began the practice of his specialty and it is to be said to his credit that neither in fair weather nor foul did he ever desert the flag under which he enlisted.

He was the first surgeon in Cincinnati to operate for gallstones. He was one of the first to operate for appendicitis. As an operator he was rapid and daring.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

He was a great believer in medical societies and attended them faithfully, contributing his share of papers and discussions. He was a member of the Cincinnati Academy of Medicine, Ohio State Medical Society, American Medical Association, a member and ex-president of the Cincinnati Obstetrical Society, an honorary member of the Virginia State Medical Society and of the Hempsted Academy. He was an ex-member of the British Medical Society and British Gynecological Society.

He joined the American Association of Obstetricians and Gynecologists, and was its President for one year, presiding in Washington. Though he was unable to attend the meetings of this Society for the last few years, he never lost interest in its doings. He never failed to call on the writer within a few days after his return from a meeting to learn all the news concerning it and was pleased to know he was still missed.


Dr. Ricketts was a loyal and fearless friend. He was generosity itself. His optimistic, cheerful and jovial disposition insured him always and everywhere a hearty welcome.

He died in Cincinnati, June 13, 1912, of cancer of the liver. The disease in this organ no doubt being secondary to that of the prostate. He was only confined to his bed for a few days prior to his death.

His remains were cremated June 15, and the ashes will be deposited beside the grave of his wife in the cemetery at Portsmouth, Ohio.

In his death this Association loses a warm friend. He had contributed his share to its past achievements and was proud of its present status and confident of its future.

"Peace to his ashes."





## TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

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*Meeting of January 2, 1913.*

*The President, GEORGE M. BOYD, M. D., in the Chair.*

DR. JOHN A. MCGLINN reported

### FOUR CASES OF FLOATING HEAD DUE TO ANTERIOR VERSION OF THE UTERUS.

THE majority of cases of floating head require considerable study and judgment in the proper selection of treatment. The following cases were due to anterior version of the uterus, all in multiparous women, and were amenable to ordinary obstetrical procedures. They are interesting because they presented unusual complications to the physicians in charge, because of the extreme degree of anteversion in two of the cases and because they all were seen within a month.

CASE I.—Patient of Dr. Haentze. Multipara. Had been in labor all day with no engagement of the head. The doctor called me on the telephone and asked me to see the case in consultation. He stated that while labor was very active and had continued many hours no engagement had taken place. He also stated that the abdomen was very prominent and that when the woman would sit the uterus rested on her lap. I instructed him to put the patient to bed and when she had a pain to lift the fundus of the uterus up so that the forces of labor would be directed toward the superior strait. I reached the patient in about forty-five minutes and found her delivered. I was informed that my advice had been followed and with three pains the woman had delivered herself. An examination of the abdomen showed a complete separation of the recti muscles. In spite of the long labor there was no uterine inertia and the patient made a good recovery.

CASE II.—Patient of Dr. Averett. Multipara. After her previous labor the patient had been quite ill for some weeks with what was diagnosed as puerperal sepsis and as she was fearful of the present confinement I was asked to be present at her labor. She was admitted to the Maternity of the Children's Homeopathic Hospital and when I saw her she had been in labor for some hours. An examination showed the uterus markedly anteverted, the cervix high up posteriorly and undilated, with no engagement of the head. The patient was put to bed and the nurse instructed to raise the fundus of the uterus with each pain. In about a half

hour the head was fully engaged and the cervix completely dilated. By this time she was well exhausted from her labor and delivery was accomplished by an easy forceps operation. An examination showed a complete separation of the recti muscles. Convalescence was uneventful.

CASE III.—Patient of Dr. Wolfson. Multipara. This patient was referred to me on account of some prolapse of the uterus, pelvic lacerations and ptosis of the abdominal viscera. On examination I found the woman pregnant and advised postponement of any operative procedures until after the termination of her pregnancy. I was asked to see her when she was in labor. I found the uterus completely upside down. When she stood the fundus of the uterus reached to her knees. The cervix could not be felt unless the fundus of the uterus was elevated to its normal position. It was then found undilated, but soft and dilatable. There was no engagement of the head. She had been in labor for some hours and was completely exhausted with the pains coming on at infrequent intervals and without force. As I had another case in active labor at a distant part of the city and as the family would not consent to another consultant, I dilated the cervix manually, and had the doctor fix the head while I applied the forceps. Delivery was accomplished without much difficulty though I did have some trouble bringing the head through the superior strait with a Simpson forceps. An examination showed as far as we could make out an absence of muscular structure in the abdominal wall. Puerperium uneventful.

CASE IV.—Patient of Dr. Savitz. Multipara. Previous labor completed by a low forceps operation with a normal-sized child. I saw this case in consultation. On examination the abdomen was protruding with the fundus markedly anteverted. The cervix was high posteriorly and undilated. The head was not engaged. She had been in labor for some hours and was pretty well exhausted. On account of the exhaustion I felt that after engagement had been secured that labor would have to be terminated by a forceps operation and as the surroundings at home were very poor I advised that she go to the hospital. She accepted my advice but some friends interfering she was advised to go to another hospital than the one I selected. She was removed to the hospital and the doctor informs me was immediately delivered by abdominal section. Both mother and baby made a good recovery.

If these cases are seen early in labor the best method to accomplish delivery is, I believe, to have the patient assume a squatting position with each pain. In this position the knees press against the abdomen and force the uterus up into its normal position.

#### DISCUSSION.

DR. BARTON COOKE HIRST.—Last year I had a patient under my care upon whom I was obliged to do a hysterectomy at the fifth month of pregnancy for a hernia of an anteflexed uterus. I would not have believed such an operation necessary had I not seen

the case. The woman could not pass water or defecate. She suffered such intense pain that she was getting heavy doses of morphia and even then she could not sleep. I could not see how she could go on four months more with the uterus in that position. Dr. McGlinn's treatment is applicable in some cases but I could not use it in this case. The postural treatment of labor to which attention has been called is a good suggestion and one of which we need to be reminded from time to time.

DR. RICHARD C. NORRIS.—I think we have all had cases of pendulous abdomen similar to that described by Dr. McGlinn. I have never had any serious difficulty with such cases and have usually employed the abdominal binder and the forceps. I have not seen a marked case since the appearance of the article by Dr. King on posture in labor. If a woman is allowed to assume her natural posture in labor it will be found, he says, to be that of the squatting posture assumed among savages. I have had cases in which in spite of the binder it was impossible to hold the uterus up and in the median line to secure engagement by the natural forces of labor and I have found it necessary to apply forceps. This subject of the floating head in obstetrics is a very interesting one. A great many men have, I think, failed to interpret correctly the present-day obstetric maxim that forceps must not be applied to the floating head and make it too wide in its application. Its prohibited use in relative disproportion is indicated. Under other rare circumstances the application of forceps to the floating head is often warranted. In multiparæ I have frequently used forceps to draw the head into the pelvis when there is not undue disproportion and labor has been delayed by inertia, after complete dilatation of the cervix. How often we have the head floating for many hours until the sac of water breaks, when the labor is promptly ended by one or two strong pains. I simply mention this, parenthetically, to indicate that the maxim, "never use the forceps on the floating head," has its exceptions.

DR. DANIEL LONGAKER.—I regret exceedingly that I did not hear Dr. McGlinn's paper. This matter of the floating head had come to me so forcibly that I published a paper upon the subject several years ago. I should say that almost invariably in the primipara, floating head is associated with a contracted inlet. I think where we find a floating head in a woman about to bear her first child we should conclude that disproportion exists. This is not necessarily so in the multipara. It may indicate disproportion, but very frequently it does not in these women who go about, working women who are on their feet many hours every day, who are bearing probably their eighth or ninth child, women who get up very soon after giving birth to their children, women who have fat abdominal walls and very frequently great anterior obliquity of the uterus and also a floating head.

With regard to the use of forceps in floating head such as we find in this last class, I think there can be no question of its propriety. When no disproportion exists there is no question of the propriety

of the forceps application. More and more am I impressed with the necessity of not using force in applying the forceps and of not making a prolonged operation of it. I think we should remember that in these cases the head frequently, and probably normally, traverses the entire bony canal in a very short time; probably it requires only a pain or two, or three, and I should say where the use of the forceps is proper, where it is properly carried out, the forceps delivery should be as quickly accomplished as the natural process; and I make it a rule where I fail to effect this to remove the forceps and make a second and more correct application, aiming always at a cephalic application of the blades rather than a pelvic, that is, to the sides of the child's head rather than to the sides of the pelvis. Where this can be done I think the use of the forceps on the floating head, the head being held in the inlet by a competent nurse, is perfectly justifiable. Not so in the primipara or in the face of existing disproportion. More and more as I study these cases am I opposed to the use of the axis-traction forceps and the high forceps operation for disproportion I have abandoned.

DR. COLLIN FOULKROD.—In the cases Dr. McGlinn has reported there seems to have been no disproportion. I have found that the simple maneuver suggested would relieve such cases in almost every instance. I want to call attention to the condition which seems to explain just such cases, one which often puzzles us to know whether the head can come through, even though the pelvic measurements are all right. I have had two such cases in the past month, having seen one to-day. We do not want to apply forceps to the floating head or allow the woman to exhaust herself. In almost every instance I find the condition is due to the interposition of a thick cervix between the head and the brim of the pelvis. I have been giving codein and morphia and allowing them to wait for several hours, when the cervix is withdrawn above the brim of the pelvis and the head goes through the cervix with no difficulty in engaging. In other instances I have obtained the same result by using ether. This relaxes the tissues and the head will drop into the pelvis. Therefore the treatment depends upon the condition of the woman. If having waited and finding the cervix will not relax with the morphia, it is better to give ether and allow the cervix to sink in when you will be able to apply forceps. When there is disproportion, measurements must be taken to determine whether section shall be done or time be given for the head to engage.

DR. OLIVER HOPKINSON.—I agree with Dr. McGlinn and Dr. Hirst regarding the postural treatment of labor. Frequently I have seen women lying on the side or walking about the room with no advance of labor; as soon as they were placed on their backs, the obliquity of the uterus corrected, the head engaged with early termination of labor. Of course this happy result can occur only where there is no disproportion between the size of the head and pelvis. Forceps may be tried upon the floating head, always remembering the dangers and contraindications. Finally I consider the postural treatment of labor a most important one.

DR. STRICKER COLES.—In such cases as cited by Dr. McGlinn—with pendulous abdomens and separation of recti muscles, with normal pelvis—I have not had trouble in delivery, but have had two cases where obstinate constipation followed delivery. In both of these cases there was a large amount of impacted feces, although the bowels had moved daily before labor. In floating head with disproportion, it is my custom to fit head carefully to pelvis, and if the disproportion is not great, to facilitate the dilatation of cervix by inserting a bag, and obtain a good molding of the child's head; then get the head out of the cervix as high up as possible, and, with the patient in Walcher's position, deliver with forceps. The application of forceps before complete dilatation of cervix and molding of head will frequently result in the death of the child and great damage to the soft parts of mother, in cases which could easily have been delivered by the method described. If the disproportion is great, then section is the only course to be considered.

DR. J. O. ARNOLD.—I am sorry I did not hear the paper. From the discussion since I came in I gather something of its import and of Dr. McGlinn's method of handling the floating head. My experience has frequently been that what I had been taught to dread has not been such a dreadful thing after all. By placing the floating head in correct position, and having it held there by an assistant until I could properly apply the forceps, I have had no great difficulty in many of these cases. I also agree with Dr. Foulkrod that much can be done by the methods he suggests, to prevent the necessity for forceps in such cases. It is not an uncommon experience, I think, with hospital men to see a case in which a difficult forceps operation or possibly an abdominal section seemed to the physician in charge to be absolutely necessary, and yet the baby would be born in the ambulance or shortly after the arrival of the patient at the hospital, by the unaided efforts of the mother. The rest produced perhaps by morphia given to quiet the patient while awaiting the ambulance, or by the anesthesia used in attempts at delivery, together with moving the patient, has converted what looked like a very difficult case into a spontaneous delivery, thus suggesting to us that rest and change of position will often make the forceps unnecessary."

#### DISCUSSION OF DRAINAGE IN ABDOMINAL AND PELVIC SURGERY.

DR. RICHARD C. NORRIS.—The halls of the Obstetrical Society have reverberated in the past many times with epoch-making discussions on the question of drainage in abdominal and pelvic surgery. I think if we judge the present by the past we can make the general statement that drainage is much less used among gynecologists, because we have learned that pelvic surgery, in a large proportion of our cases, does not require the drainage so commonly employed in the past. The technic has changed, hemostasis is better, operation more finished and we leave a drier field. We have come to know that in many of our cases the infection has lost its virulence. We

have learned to respect the power of the peritoneum to deal with infections, and for that reason, drainage in strictly pelvic cases has become less and less frequent in the hands of the skilled and experienced operator. In that group of cases which the general surgeon, and often the gynecological surgeon, see—intestinal, gall-bladder and appendiceal surgery—the problem is wholly different and here various means of drainage are resorted to and the technic of drainage is elaborated more and more and this will continue to be so. We have here different types of infection and different conditions to meet. As to the method of drainage we must again classify our cases. In the cases in which the infection has lost its virulence there are at times dense adhesions. In spite of better hemostasis obtained by hysterectomy and careful peritoneal closure of raw areas we do leave raw surfaces which we wish to drain and there I use almost exclusively the vaginal drain. When I do hysterectomy, if I drain at all, I drain through the culdesac.

I have tried to elaborate some plan which would take away some of the disadvantages of the after-care of these cases; in the ordinary ward work you cannot give the time to it yourself. I find that the average house surgeon, unless he has been in the service for some time, cannot remove and replace the drain skilfully. It is my routine to introduce and cover a short T-shaped rubber drainage tube with the gauze drain that passes through the posterior culdesac, stitching this tube with catgut to the posterior lip of the amputated cervix. The tube is placed through the culdesac, anchored with a stitch of catgut and the gauze then inserted until the tube is completely covered. The resident, partially, sometimes wholly, removes the gauze on the third day and the tube remains in place. If this method is not used, it is desirable, when the gauze is removed, that the tube should at once be placed through this opening per vaginam. This is for the cases of chronic pelvic infections when large raw areas remain in the pelvis. There is a class of cases in which I feel that abdominal drainage is absolutely necessary. These are the early puerperal cases after labor at term, the virulent forms of infection with localization or without localization, which have undergone suppurative change. Here it is essential to freely protect with gauze and to have as wide a drainage as possible by the abdominal drain and often drainage both ways, *i.e.*, through the abdomen and through the vagina.

In septic cases after abortion and miscarriage, as my experience goes, I am disposed more and more not to open the abdomen, but to use the wide vaginal opening with extensive packing and wide open drainage through the vagina. In this class of cases infected areas, early attacked, are within your grasp. Usually this type of surgery will not avail in sepsis after labor at term. There may be and usually are conditions that require more than drainage and here I feel we must resort to the abdominal route and employ the abdominal drain.

That in brief is the expression of my ideas on this subject. I shall be glad to hear from those who have had more experience than I.



DR. E. E. MONTGOMERY.—It seems to me there should be no question as to the method of drainage in cases in which it is possible to use the vagina for that purpose, cases in which the parts to be drained are situated within the pelvis. I fully agree with Dr. Norris that we do not drain with the former frequency. Instead of the old dictum, "When in doubt, drain," we pursue the opposite—when in doubt, do not drain. The vaginal drainage has an additional advantage in extensive adhesions in that the intestines are walled from contact. Adhesion of the outer surface of a loop of intestine is always a source of danger. It can easily become twisted. One often sees such cases in which a temporary volvulus may be undone and return.

There are cases in which abdominal as well as pelvic drainage is desirable, such as suppurative peritonitis extending into the abdominal cavity. Here the pus accumulations are situated in the sides of the abdomen above the pelvis where effectual drainage through the vagina is impossible. Not infrequently the salvation of the patient depends upon a number of openings which may be made to communicate by gauze or rubber drains. The effective and ready drainage of the abdominal cavity prevents the formation of pus collections but where possible the vagina as well should be utilized.

It is my custom to use gauze both as a drain and as a pack. I leave it in place until the intestines have formed adhesions. I then withdraw the drain and do not replace it. I allow the parts to gradually retract and the cavity to drain itself. I remember one case in which the resident in removing the drain drew down a loop of intestine. I was sent for to replace it. In this case it was advisable to replace the gauze drain by another. I placed the patient on her side with the pelvis slightly elevated when the intestine dropped back. All that was necessary was to insert gauze beneath it.

DR. BARTON COOKE HIRST.—I have had better results from abdominal drainage than from the vaginal. I have tried both extensively. We ought to consider the disadvantages of vaginal drainage before adopting it in preference to the other. To my mind these disadvantages are:

1. The drain cannot be left in as long. Experience teaches that one gets better results from a gauze drain if it is left in from eleven to fourteen days. A vaginal drain cannot be left in that long; it becomes too foul.

2. There are more cases of intestinal obstruction following vaginal, than abdominal drainage.

3. It is not so easy to put the vaginal drain in from above as it is to put the abdominal drain in. I know of three hospitals in this city in which the resident when asked to insert his finger into the vaginal opening, with his ignorance of the difference between the two orifices, put his finger into the rectum. This was cut down upon and gauze put into the bowel.

4. Our results I think speak in favor of abdominal drainage. In acute streptococcic infections following childbirth I have reduced the mortality to less than 10 per cent. in over 160 operations. I

could not get as low a mortality with vaginal drainage. There are too many cases of ascending infection. If the abdominal drainage is put in properly and left in long enough to become well encapsulated the results are good.

My feeling then is in favor of abdominal rather than of vaginal drainage. Naturally there are cases in which vaginal drainage is obviously more suitable. Another thought occurs to me: In all cases of pelvic surgery for infection it is an advantage to put the patient in the Fowler position. If that is done with the use of the vaginal drain there is a strong predisposition to prolapse of intestinal coils in the drained area. That means intestinal adhesions in an unfavorable situation if it does not mean intestinal obstruction.

DR. GEORGE ERETY SHOEMAKER.—In my practice I have drained just as little as possible and only for active suppurative infections not gonorrheal. A drain is indicated in the presence of the colon bacillus in an active stage as evidenced by necrosis and impending perforation of the bowel in pelvic abscess, also in various active stages of appendicitis; also it is indicated in the presence of the virulent forms of puerperal sepsis should the last named require operation. Most of the postpuerperal cases in my hands are not operated on at all and seldom through the abdominal wall. We have quite a series of septic abortion cases coming into our hands and unless perforation is suspected they are apt to be drained, if at all, from the vaginal side or are treated expectantly if that is possible. A very large proportion of the puerperal sepsis which I see gets well in that way. The vaginal drain placed from above I use occasionally. The vaginal drain for walled-off pus collections has been in my hands extremely satisfactory, particularly in puerperal cases developing abscess in the culdesac. Those cases opened from below almost invariably do well. It is not my custom to replace a gauze vaginal drain when once removed. In replacing gauze through a drainage tract we are passing gauze from a more variedly infected area to a differently infected area, and if gauze is replaced at all it should be done through a clean metal tube passed in to a point as high as possible and then the gauze passed in through the tube to avoid dragging in other types of organism, or those in different stages of activity.

DR. STEPHEN E. TRACY.—I fully agree with the statements made by Dr. Norris. When a pelvic case requires drainage, and such cases are comparatively few, I much prefer the vaginal route and have never seen a case of ileus follow drainage by this method. I have never cut into the rectum, as I do not use a guide inserted into the vagina. The vaginal wall is caught midway between the uterosacral ligaments by a pair of forceps back of the cervix and by another pair of forceps about 4 centimeters farther back, and a cut made into the vagina. In case there is active bleeding from the cut vaginal wall, this is controlled by placing a suture at each angle of the wound. The vagina is packed with roller bandage gauze, and the desired quantity placed in the pelvis. The sigmoid is then dropped down, and in many cases it completely covers the gauze, and can be made to do so by a

few sutures properly placed. In case it is necessary to drain after doing a hysterectomy, one can either cut through the vaginal wall or split the posterior lip of the cervix down into the vagina, and continue the cut as far along the vaginal wall as is necessary. In cases of hysterectomy, after the drainage gauze is placed in the vagina and pelvis, the bladder reflexion of the peritoneum, which should always be left as long as possible, is sutured to the round and infundibulopelvic ligaments and sometimes to the edge of the sigmoid. By this technic the pelvis is entirely shut off from the clean peritoneal cavity above, no raw surfaces are left to form adhesions, the abdominal incision can be closed, no hernia follow, and the results are excellent. The gauze is removed from the vagina on the second or third day. On the following day what pelvic gauze comes away easily is removed, and this is repeated daily until it is all out. Immediately after the last portion of gauze is removed, a soft rubber T-drainage tube is inserted through the vaginal opening. The tube is allowed to remain until the drainage discharge ceases, then it is removed. By this method I have never had an accumulation of fluid following the removal of the gauze, in fact the tube if properly placed, eliminates all further trouble.

While I am a strong advocate of vaginal drainage, nevertheless I believe that puerperal and other virulent infections, spreading peritonitis, cases with involvement of the bowel, should have abdominal drainage or abdominal and vaginal drainage combined. In such cases I use a rubber tube, gauze and rubber tissue. In puerperal cases when it is necessary to operate and drain through the abdominal incision, and there is no involvement above the pelvis, I place a piece of rubber dam in the pelvis and spread it all the way across the abdomen, pack the pelvis full of gauze, and bring the end of the gauze and the rubber tissue through the lower end of the incision. The rubber dam prevents the bowels from coming in contact with the gauze, which is soon saturated with septic material: the infected area is walled off from the clear peritoneal cavity above: the gauze can be removed with very little discomfort to the patient, as it is not adherent except the point in immediate contact with the pelvic tissues: protecting adhesions are not disturbed, and I believe better drainage is secured by rubber tissue and gauze than by gauze alone.

DR. P. B. BLAND.—I believe that packing or drainage after abdominal and pelvic operations should be employed as little as possible. However, when drainage is required following operations upon the pelvic organs, I feel that one should select the drainage canal that nature has already provided; namely, the vagina. In my judgment, drainage through the abdominal incision should only be used in certain specific instances, as in suppurative conditions of the peritoneal cavity more or less generalized above the brim of the false pelvis. I have found from personal experience that one may allow gauze to remain in the pelvis just as long as in the abdominal incision and without any of the objectionable conditions arising that have been mentioned. In my practice, I always allow gauze to remain in the pelvis and vagina from seven to ten days. I do this

for several reasons. When it is allowed to remain several days, the drainage material has practically all disappeared and one is also not likely to disturb adhesions which form over and about the gauze after waiting this length of time. Moreover, gauze when allowed to remain in the pelvis and vagina for a week or ten days is saturated and coated with exudate and is, therefore, more readily removed.

Gauze drainage whether in the abdominal incision or in a posterior vaginal incision, should not be removed on the second or third day after operation, because it has become adherent to the intestines and pelvic wall and its removal breaks up adhesions and tends to scatter infection. Moreover, repacking is required when gauze is removed early. This is not the case when it is allowed to remain several days. I never repack the pelvic cavity after removing vaginal drainage. It has been stated that after pelvic drainage, intestinal obstruction may occur, but this catastrophe is not any more likely to follow pelvic drainage than it is abdominal drainage; in fact, if one is careful in packing the pelvic cavity generously, the intestines are well elevated out of the pelvis. In nearly all cases of abdominal drainage, ventral hernia follows and one may have obstruction of the bowels due to strangulation. One of the causes of reaccumulation in the pelvic cavity after gauze has been removed, is the fact that frequently a shelf of vagina projects forward toward the cervix and acts like the breast of a dam, thus imprisoning material in the pelvis. This can be overcome by cutting closer to the rectum and also to a certain degree by having the patient sit up in bed or, if possible, out of bed soon after the gauze has been removed. Apparent reaccumulation of material in the pelvis after the removal of gauze drainage may be due to the early use of the vaginal douche. In doing this, material may be washed up in the pelvic cavity and not escape. Therefore I feel that it is better to avoid the vaginal douche for several days after gauze has been removed.

Abdominal drainage also is objectionable because it prolongs convalescence, it keeps the patient in bed a greater length of time, it is very distressing and more uncomfortable than a vaginal drainage, it leaves a more unsightly scar in the abdomen and it predisposes to incisional hernia with subsequent, in a great many cases, intestinal obstruction.

DR. MCGLINN.—I feel that there are very few cases in pelvic surgery at the present time that have to be drained. In my experience the majority of the acute septic cases get well without operation. Regarding vaginal or abdominal drainage, I know of a case like that mentioned by Dr. Hirst, in which an opening was made through the bowel instead of the vagina, and gauze brought out through it. I reserve vaginal drainage for those cases in which there is marked denudation of tissue well down in the pelvis and in which we desire to control the bleeding by packing and drainage. With active infection in the pelvis or in old cases where there is marked tearing of the bowel, I have always felt that abdominal drainage is very much better. You can drain a larger area with abdominal

drainage and almost close up an entire incision. There is a very small opening left after the gauze is removed and if hernia occurs it must occur but seldom. The gauze is never taken out so long as it is hard to get out. I have never had to allow it remain more than ten days. It does not become foul and is easily removed, provided you allow it to remain long enough—from five to ten days. In these cases placed in the Fowler position the upper part of the incision rarely becomes infected. They close in a short time and convalescence is as quick as if vaginal drainage were employed.

DR. NORRIS, closing.—I think my reading in the last five or six years has convinced me that gynecological surgeons have drained more and more through the vagina and less through the abdomen. I am glad to hear and agree with what Dr. Hirst has said in regard to the puerperal septic cases. I have a case at the present time in which the infection was on one side involving the broad ligament at the left of the uterus and reaching upward obliquely above the level of the umbilicus, in which it would have been the height of folly to drain only through the pelvis. The plan I follow is almost identical with that mentioned by Dr. Tracy. The fact has not been brought out that gauze soaked with fluid loses its power to drain unless it is in contact with a dry area. In some of my abdominal cases and also in the pelvic cases in which the drainage gauze has remained longer than two or three days a lot of bad smelling material oozes out. That brings up the question of how soon a gauze drain should be removed. This depends upon the indication for drainage. If the drain is removed early, *i.e.*, after two or three days, it is astonishing how promptly the vaginal opening will close. It will close much more rapidly than the abdominal drainage tract. There must be made provision for final drainage after you have removed the vaginal drain. I know of nothing better to prevent premature closing of the vaginal puncture than the catheter, with partial removal of the distensible, balloon-like end, used for distending the bladder. If by draining through the vagina we can prevent hernia alone we have accomplished much in favor of vaginal drainage. We have as many hernias as we did from the glass tube if we drain through the abdomen with gauze and leave it in for a week or ten days. In a case in which I feel that gauze must be left for a long time, I use rubber dam with gauze as a cigarette drain or gauze in a split rubber tube. To my mind it is the rubber that secures the drainage and not so much the gauze in these cases. When draining through the abdomen I also use this combination of gauze and rubber. It can be used for a longer time and secures greater drainage. If abdominal drainage is to be used, and generally in the gravest type of acute puerperal cases it is, and we expect to leave the drain in for a long time, we should use rubber and gauze combined.

DR. GEORGE ERETY SHOEMAKER.—I should like to add that I always try to get all gauze gradually out by the sixth day. I have had much satisfaction with the T-shaped tube drain in the vagina.

## A CASE OF UNUSUAL PELVIC DEFORMITY.

DR. BARTON COOKE HIRST.—I desire to put on record a curious deformity of the pelvis which in my experience is unique and of which I can find no record even in Breu's and Kolisko's book on "Deformities of the Pelvis" in three volumes, which took twelve years to complete. This woman I operated on last year by Cesarean section. She had a symphysis pubis which measured 6 centimeters in height. I cannot find a record of such a case. The pelvic inlet was perfectly normal measuring 11 centimeters in anteroposterior diameter. In consequence of the decrease in the conjugato-symphyseal angle, the lower edge of the symphysis was diverted backward leaving a measurement of only 8 centimeters between it and the tip of the sacrum which would not allow a normal fetal head to emerge. Another peculiarity of this pelvis was that as the woman lay on her back the lower edge of her symphysis pubis was on a level with the posterior commissure of the vulva and pressed upon the posterior vaginal wall. It was consequently impossible to make a vaginal examination without forcibly pushing the posterior vaginal wall backward. In view of its rarity I wish to incorporate the report of this deformity of the pelvis in our Transactions.

## TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

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*Meeting of January 14, 1913.*

*The President, GEORGE G. WARD, JR., M. D., in the Chair.*

## DEMONSTRATION OF NEW INFANT PULMOTOR.

DR. J. CLIFTON EDGAR gave this demonstration. See page 255.

In reply to a question Dr. Edgar stated that at 5.30 that afternoon a case was brought into the Manhattan Maternity by ambulance during his clinic. The membranes had ruptured the night previous. The woman had a moderately flattened pelvis and a conjugate of 8 or 9 cm. There was a tremendous caput succedaneum. The head was displaced and he tried to palpate the cord around the neck. There was no pulsation to be felt in the cord. Quantities of meconium were escaping from the vagina. Dr. Edgar had his perforator boiled and ready. There was a large hematoma of the left vulva. He believed that the baby was dead and that the head should be perforated to expediate its delivery. No fetal heart sounds could be heard. The baby was delivered with forceps and, by the use of the pulmotor, was not difficult to resuscitate. All present thought that the baby was dead.

Dr. Edgar reported another case which he saw with Dr. Klotz; the



anesthetist was Dr. Hassler. This was a shoulder presentation. The membranes had ruptured many hours before and there was a prolapsed cord. In this case there was a doubt as to what should be done. Version was, however, performed. The baby was apparently dead but by means of the pulmotor the infant was resuscitated. Personally he thought that the use of oxygen had something to do with the resuscitation of the baby. Dr. Edgar has seen two other cases which had been equally helped with the use of the pulmotor.

DR. ROBERT L. DICKINSON believed that many of these cases of asphyxia were saved by the use of oxygen inhalation as we have been taught by Dr. Holden.

DR. HENRY DAWSON FURNISS called attention to the so-called dead space that existed in intratracheal anesthesia, and thought that the same would exist with the pulmotor. He suggested that artificial respiration might be better carried on by forcing oxygen into the lungs after catheterizing the trachea to its bifurcation.

DR. J. CLIFTON EDGAR said that some years ago the question of catheterizing the trachea came up, a very difficult thing to do in the new-born. A French catheter made by some one in Paris was attempted and its use abandoned; Dr. Edgar said he would not attempt its use.

DR. HENRY DAWSON FURNISS showed an interesting

#### RADIOGRAPH OF THE RIGHT KIDNEY WITH STONES

situated as follows: one (or two?) large ones extending from the upper calyx down into the ureter for an inch and a half, and nearly one-half inch in diameter. Near the middle of the kidney, nearer the cortex than the pelvis was a shadow one-half inch in diameter and in the lower pole a shadow  $\frac{3}{16}$  inch in diameter. In the upper pole were shadows of three small stones close together. The patient (referred by Dr. C. C. Guion of New Rochelle) is a woman forty-three years old, the mother of two children, the youngest being fourteen years old. Normal labors. Has had two abortions, the first before the birth of the first child, and the last eight years ago, the one spontaneous and the other induced by drugs. No trouble with either.

For ten years the patient has had some frequency of urination, getting up nights from two to four times. Never noticed any pus in her urine until January, 1912, when she had quinsy and the urine was examined. No pain in the lumbar region until two months ago when she had a sharp stitch in the right side lasting only a few minutes. That night there was a chill, which was succeeded by temperature which lasted one week. A month ago had a second attack of temperature for a few days, but unaccompanied by pain. She was first seen on Dec. 3. Examination. Right kidney normal size, upper pole at costal margin. Bladder negative. Both ureters catheterized. Perfectly normal urine from left. On the right side the ureteral catheter could be passed only nine and a half inches; it drained light colored urine containing a large amount of pus. The

bacteriological examination of this showed a pure culture of colon bacillus.

On January 12, 20 c.c. of .4 per cent. solution of indigo-carmin was injected into the buttocks. On the left it showed strong in twelve minutes. The ureteral spurt was of five seconds duration and it was thirty seconds between spurts. On the right it appeared very light after twelve minutes and did not increase in intensity even after fifty minutes observation. Each spurt was fifty seconds duration and it was ten seconds between spurts.

It is a question whether, in view of the functional activity of the right kidney being so low, it would not be better to do a nephrectomy rather than remove the stones and leave the kidney. The lack on intensity of color on the right side may be due to the existing polyuria of this kidney.

Additional note. On January 17, this patient was operated upon. The large shadow was that of two stones, one extending up in to the kidney and the other down into the pelvis. These were removed through the pelvis posteriorly; the wound into the pelvis was left unsutured. The other stones were removed through incisions into the cortex, which were closed with mattress sutures of catgut to prevent hemorrhage. Wound closed with catgut except posteriorly where a cigarette drain was inserted. The patient has had some temperature since operation (January 21), but is comfortable and in good condition. The urinary drainage through the wound ceased in sixty hours, even though the pelvis was left open. A considerable amount of blood appeared in the bladder urine for thirty-six hours, which showed the patency of the ureter and the tendency for fluids to pass down the ureter, even though the pelvis is wide open. The kidney did not appear much involved. It would have been better, in view of the polyuria of this side to have made a relative quantitative estimate of the two sides with phenolsulphonephthalein.

DR. WILLIAM P. GRAVES, of Boston, by invitation, read a paper on

#### THE OVARY AS AN ORGAN OF INTERNAL SECRETION.\*

#### DISCUSSION.

DR. EDWIN B. CRAGIN said that he wished to thank Dr. Graves for the scholarly paper he had presented and for bringing this question before them, a question in which they were all interested and about which they knew so little.

There was one point of special value which Dr. Cragin wished to call attention to and that was that infantilism might be a general condition rather than a condition of the pelvic organs, and this was especially important as long as their neurological friends occasionally wished them to operate upon the pelvic organs for infantilism when the trouble was general rather than local. A practical question brought forward by this paper was: Shall healthy ovarian tissue be left in the pelvis in the performance of a hysterectomy?

\* For original article see page 649.

In compiling a table of comparative statistics regarding the nervous symptoms of patients after hysterectomy in some of whom the ovaries had been removed and in others left, it should be borne in mind that in some patients the neuropathic symptoms were relieved by the removal of the tumor whether the ovaries were removed or not and it was difficult to tell whether the improvement was greater or less in the individual case with the ovaries removed or left. Those of the Society, however, who could look back twenty-five years and could remember the time when ovaries were removed on slight provocation, remembered well the neuropathic symptoms of these women, especially the young women, from whom both ovaries had been removed.

It was Dr. Cragin's custom to leave all the healthy ovarian tissue possible in the course of a hysterectomy and he believed his patients were better for it. Dr. Cragin's experience with ovarian extract was not especially encouraging. It had relieved symptoms in some cases but he was not at all enthusiastic over its use. He asked Dr. Graves what preparation he employed.

DR. WILLIAM S. STONE expressed his appreciation of what Dr. Graves had presented them with and there were but two points that he wished to bring out.

The first was the result of observation that he had made at the Vanderbilt Clinic and covered over a period of thirteen years. During the last five years the number of these generally miserable cases that followed abdominal operations was decided less than during the first five years of this period. This was probably due to the improvement in their surgical technic. This was a point that Dr. Graves brought out and it was one of great importance.

The second point was in the selection of the cases for operative procedure; this was of decided importance. That meant that in every case that came to them with a long train of nervous symptoms and who was examined carefully and found to have some abnormal condition in the pelvis, not immediately to rush in and expect to find some close connection between the lesion in the pelvis and the general nervous system.

In operating they should not lose sight of the possible improvement in the patient's condition by the use of the ovarian extract. Dr. Stone was recently called to see a patient and he found that she had a general arteriosclerosis which was decidedly premature. In this case the condition was first supposed to be a purely local one. The failure of benefit from the use of the ovarian extract was evident, and readily accounted for.

DR. HENRY C. COE said that the subject under discussion had always been of great interest to him, but he was not yet prepared to express any definite opinion with regard to the so-called internal secretion of the ovary. It had been his habit to seek for an anatomical basis for every theory, physiological or pathological, and the evidence in this particular line was not yet satisfactory, though he could recall two cases in which he had had an opportunity to study at the operating table premature atrophy of the ovaries,

causing amenorrhea in young women. He was able to speak feelingly about the postclimacteric disturbances, following castration in women below the age of forty, as he could recall the *furor operandi* of early days, when ovaries were "arrested on suspicion," which would now be regarded as quite normal, both macroscopically and microscopically.

He agreed with Dr. Cragin that the neurologist was hardly a safe guide in cases of obscure nervous disturbances (without palpable disease of the pelvic organs) as to whether castration, or a more radical operation was clearly indicated and promised a symptomatic cure.

Dr. Coe's experience had been similar to that of the last speaker concerning the value of organotherapy. He had found that corpus luteum extract (which he had used extensively) had in some cases a beneficial effect in relieving the familiar "hot flushes," but he had been disappointed with the results obtained in the treatment of amenorrhea—whether of ovarian or uterine origin.

DR. VINEBERG said there were a few things, the reader of the paper had stated which were somewhat of a surprise to him. One was the not infrequent absence of the ovaries, in cases of undeveloped uteri and, the other was, the high percentage stated, of absence of the ovaries, in cases of absence of uterus and vagina. These statements were not in accord with what he had been able to find in the literature, on the subject. Nor were they in accord with his own experience, in two cases of total absence of uterus and vagina, that came under his observation. He had performed a laparotomy, in both cases, for the purpose of relieving distressing menstrual molemina and in both, he found a well-developed ovary, on either side. In both instances, however, the ovaries were not situated in their usual position, but were found very high up in the abdominal cavity. It was not safe to assume the absence of the ovaries, from a bimanual examination, even under anesthesia, in fact, one may go further, and say, even with the abdomen open and a diligent search made. Cases are recorded in the literature, where such a search was negative, and at the autopsy, afterward (the patient dying of peritonitis), well-developed ovaries were found in abnormal positions.

Dr. Vineberg was particularly gratified to hear what Dr. Graves stated, regarding his investigations of those patients, on whom he had performed hysterectomy and removed the ovaries, as well. It was his own custom to remove the ovaries, almost in every case. He recalled one case, in a very young married woman, in whom he was particularly anxious to avoid, if possible, the symptoms, usually attendant upon the artificial menopause and left the left ovary *in situ*. Shortly after the convalescence from the operation, the patient developed irregular temperature with some abdominal symptoms, and as she was rather stout, it was not easy to eliminate inflammatory changes in the ovary, as the cause of the fever, until later developments showed that the patient had typhoid fever. For the next two years following the operation, the patient suffered as se-

verely from vasomotor neuroses, as any patient under his observation, in whom both ovaries had been removed. Four years after the operation, the patient began to suffer with pain in the left iliac region and, an oval mass, the size of an English walnut was palpated. The pain persisted with variable intensity and, the mass gradually grew larger, so that it reached the size of a mandarin orange. He operated upon the patient a couple of months ago and found a cystic mass of the size above stated, covered with adherent intestines and bladder, with as great technical difficulties as he had almost ever encountered. With such an experience, he will not be easily convinced of the wisdom of leaving one or both ovaries behind, when the uterus has to be removed. After all, we are still in the region of speculation, as to whether the ovary has an internal secretion, which has a relation to any function other than menstruation and nidation. Further, it has been shown that the ovary, after the removal of the uterus, undergoes atrophy rather rapidly. Taking these matters into consideration, are we justified in leaving the ovaries behind in hysterectomy, and thus subject our patients to the risks of a subsequent operation for a cystic ovary? There is still a further consideration, when we have to deal with a very much distorted uterus, through multiple fibroids, or with ovaries very much displaced, through a large interstitial fibroid, we cannot possibly leave the field of operation in such an ideal condition, as when the tubes and ovaries are removed with the uterus and its growths.

DR. ROBERT T. FRANK said he congratulated Dr. Graves on the judicious selection of the salient points emphasized in his paper. Only those who had attempted to cull the literature dealing with the ovaries could appreciate the difficulties of this task. He also realized the value of the practical deductions set forth by the reader of the paper.

In analyzing the action of the ovary it was essential to consider the functional effect of this gland under three headings: 1. mass action as shown by castration and reimplantation; 2. indirect action through its influence on the other glands of internal secretion; 3. action of the individual constituents of the ovary.

The stereotyped criticism that experimental results could not be directly applied to practical medicine had some force, but certain facts could not be controverted. Chief of these was the one that the ovary is an organ of internal secretion. This, Halban's work on reimplantation of the ovaries in menstruating apes had put upon an unshakable foundation. The interdependence of the glands with internal secretion had likewise been definitely proved—effect of castration on the hypophysis; hypophysial hypertrophy with consequent ovarian hypoplasia, etc., etc.

Finally it became necessary to take up the analysis of the function of the various constituents of the ovary separately. To be considered were the follicle apparatus, the corpus luteum, and the interstitial gland. In considering the puberty changes and the first menstruation, the action of the corpus luteum could be excluded,



as these phenomena took place before this body was formed. The interstitial gland could also be eliminated with considerable certainty, as it had been found wanting in many species (Fraenkel) or but poorly developed at this period of life. The follicle apparatus, therefore, by exclusion alone came into consideration.

Attention had been first focused upon the corpus luteum by Fraenkel, and his work was still regularly quoted. This investigator's method of experimentation was uncertain and his deductions faulty. Therefore, Fraenkel's work ought long ago to have been eliminated from its prime position in the literature, and the work of Leo Loeb substituted. Loeb had shown that firstly the corpus luteum inhibited menstruation (postponed the menses) and if the yellow body persists unduly—as it did in cows—caused amenorrhea until removed. Secondly, he had demonstrated that the corpus luteum prepared the uterus for the reception of the fertilized ovum by sensitizing the uterine mucosa. In response to the foreign body effect of the ovum a vigorous decidual reaction, which was necessary and favorable for nidation, then resulted. This work had been performed on rodents.

The function of the interstitial gland was still unknown. Bouin and Ancel's view that this gland compensated or replaced the activity of the yellow body was purely speculative. It was necessary to remember that this gland was not found in all species and that in the human being its occurrence was highly problematic. The contrary applied to the corpus luteum.

With these facts in mind it was necessary to scrutinize the reports on oöotherapy. All investigations had shown that experimentally, ovarian extracts could not replace the ovarian function, and could not prevent genital atrophy. The work of Schickele, quoted by Dr. Graves, had escaped the speaker's attention. If confirmed it represented the sole instance in which a fresh organ extract inhibited clotting, when applied intravenously. The hyperemia of the external genitals could not be considered specific, as wide-spread congestion, etc., results from the use of this extract.

The majority of authors had agreed that ovarian or lutein preparations favorably influenced the cardiovascular symptoms of the menopause. The speaker's own experience did not confirm this. As these symptoms, moreover, were objectively uncontrollable and protean in their manifestations, they did not afford a firm basis for clinical, and no foundation whatever, for scientific, deductions.

Even were the speaker able or willing to forget the complete lack of experimental or objective evidence pointing to the efficacy of ovarian preparations, he still had an equally weighty objection to offer. Oöotherapy, apparently, was a cure-all! From the literature he gathered that it was of equal value in amenorrhea, dysmenorrhea, sterility, menopause symptoms, menorrhagia and metrorrhagia, etc. If they would analyze these symptom complexes, they would at once note this incongruity; some symptoms being due to lack of ovarian function, others to excess of ovarian activity. Much further and



much more convincing evidence would have to be adduced before he was ready to change his views.

DR. DOUGAL BISSELL.—The function of the corpus luteum is a feature of great interest. Is its presence necessary to the development of the fetus? Is its removal conducive to fetal expulsion? Does it have any influence upon the development of the fetus and if so at what stage of pregnancy is this influence the greatest? Some authorities claim that if the corpus luteum is dissected from the ovary during an early stage of pregnancy the woman will abort within two weeks. My experience is limited to a single case supporting this theory. The patient about two and one-half months pregnant, was, when she sought my advice, in much distress from an ovarian tumor situated anterior to the broad ligament. Believing that the tumor could be removed without disturbing pregnancy I advised operation; the cyst two or more inches in diameter was located in the proximal pole of the right ovary and completely filled the space between the bladder and the broad ligament. The corpus luteum was situated between the ovary and the tumor and was removed with the tumor. No pelvic manipulation excepting the examination of the left ovary was done. The patient had an absolutely uneventful convalescence until the tenth day when she suddenly expelled the contents of her uterus. It is held by other authorities that the presence of the corpus luteum is not essential to fetal development and cases to support this theory are cited where the ovary with the corpus luteum has been removed without interrupting pregnancy.

DR. GEORGE G. WARD, JR., asked Dr. Graves if in the investigation of his 136 cases he had made a study of the relation of the age of the patients to the symptoms following the operation.

DR. GRAVES did not attempt to draw any definite conclusions but the experience he had corresponded with that of other writers. He simply could not find anything particular in regard to the age of these patients, or the relation of their age to the symptoms following operation.

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## ITEMS.

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### CLINICS, DEPARTMENT OF PUBLIC CHARITIES.

*Calendar for April, 1913.*

N. Y. City Children's Hospitals and Schools, Randalls Island.—Orthopedics, Dr. Ogilvy, Tuesdays, 10:00 A. M.

Kings County Hospital (Brooklyn).—Obstetrics, Dr. Cominskey, Tuesdays, 10:00 A. M.

City Hospital.—Obstetrics, Dr. Dorman, Wednesdays, 2:30 P. M.

Cumberland Street Hospital (Brooklyn).—Gynecology, Dr. Pierson, Wednesdays, 2:30 P. M.

Kings County Hospital (Brooklyn).—Orthopedics, Dr. Truslow, Wednesdays, 9:00 A. M.; Orthopedics, Dr. Napier, Wednesdays, 2:00 P. M.

Coney Island Hospital.—Pediatrics, Drs. Beck and McQuillan, Wednesdays, 3:30 P. M.; Drs. Pendleton and Van Wart, Wednesdays, 3:30 P. M.

City Hospital.—Gynecology, Dr. Stearns, Thursdays, 2:00 P. M.

Kings County Hospital (Brooklyn).—Obstetrics, Drs. Cominskey and Judd, Thursdays, 10:00 A. M.

Coney Island Hospital.—Gynecology, Dr. McEvitt and Mills, Thursdays, 10:30 A. M.; Drs. Mayne and Ranken, Thursdays, 10:30 A. M.

Kings County Hospital.—Obstetrics, Dr. Cominskey, Saturdays, 10:00 A. M.; Gynecology, Dr. McNamara, Saturdays, 1:30 P. M.

All registered physicians, visiting and resident, and medical students are cordially invited to attend these clinics.

Cards of admission, valid until October 1, 1913, may be obtained at the *Academy of Medicine*, 17 West 43rd Street, Manhattan, and at the *Medical Society of the County of Kings*, 1313 Bedford Avenue, Brooklyn, as well as from the secretaries of the several medical colleges.

## THE PREVENTION OF INFANT MORTALITY.

An English-speaking Conference on the Prevention of Infant Mortality will be held in Caxton Hall, Westminster, London, on Monday morning, Monday afternoon and Tuesday morning, August 4th and 5th. The meetings will be held under the auspices of the (British) National Association for the Prevention of Infant Mortality and The Welfare of Infancy under the Patronage of the King and Queen, and will convene immediately preceding the opening of the International Medical Congress.

A tentative program has been issued by the Committee which indicates that the papers will consist largely of medical opinion. The subjects treated will be:

The responsibility of central and local authorities in infant and child hygiene.

The administrative control of the milk supply.

The necessity for special education in infant hygiene.

Medical problems in infant nutrition.

Antenatal hygiene.

The President of the Conference will be the Hon. John Burns, M. P., President for the Local Government Board. The chairman of the English Executive Committee is Sir Thomas Barlow and the Secretary, Miss J. Halford, 4 Tavistock Square, London, W. C.

The American Committee, in charge of the part to be taken by the United States and Canada, will furnish information to those desiring to attend the conference.

Dr. Henry L. Coit, Chairman, 277 Mt. Prospect Avenue, Newark, N. J.

Dr. Philip Van Ingen, Secretary, 125 East 71st Street, New York City.

## BRIEF OF CURRENT LITERATURE.

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### OBSTETRICS.

**Peritoneal Adhesions.**—In a paper that is well worth careful reading Joseph E. Adams (*Lancet*, March 8, 1913) summarizes the results of a considerable number of experiments performed on guinea-pigs and rabbits with a view to ascertaining the causation of peritoneal adhesions, their histology, their permanence, and, to some extent, their prevention and cure. It has long been recognized that foreign bodies placed within the peritoneal cavity rapidly become surrounded by inflammatory tissue and ultimately become firmly adherent to the viscera or abdominal wall where these are clothed by peritoneum, and this method is admirably suited for the study of experimental adhesions. Such foreign bodies may be sterile or infected; in either case inflammation is set up and adhesions result, and the production of adhesions in this way is often relied upon for the success of surgical procedures. One commonly speaks of "aseptic" abdominal surgery, and as a clinical term this is permissible, but it must be remembered that pathology demands a higher standard of perfection, and the technic of the operation and its results must be submitted to cultural tests; only when these are negative is it justifiable to speak of an aseptic or, better, sterile wound. The presence of unsuspected organisms accounts for many of the misfortunes of abdominal surgery, and their relation to the formation of peritoneal adhesions is a question which has received too little attention. The bactericidal power of the intact peritoneum is undeniable, and yet a comparatively slight infection may be enough to ruin the perfect smoothness of endothelial continuity. It is common to speak of "protective" adhesions which wall off infected areas of the peritoneum from the general cavity, but, unfortunately, these may eventually lead to intestinal obstruction and prove disastrous rather than beneficial. The investigation of this problem is essentially the study of inflammation within the peritoneal cavity, and, if we accept the definition of Grawitz, these adhesions are the product of "the reaction of irritated and damaged tissues which still retain their vitality." The tissues in question are the endothelial, subendothelial, and muscular layers of the viscera, the omentum and the structures of the abdominal wall—all vascular areas, and all capable of considerable cellular proliferation provided their cell nuclei are not destroyed. Peritoneal adhesions may be infective or noninfective, and in each case the newly formed tissue may be fibrinous (acute inflammatory exudate) or fibrous (chronic inflammatory exudate). Adhesion by fibrinous exudate is perhaps better termed "peritoneal agglutination." The endothelium of the peritoneal

cavity normally gives rise to a fluid exudate, and inflammation here, as elsewhere in the body, causes this exudate to be abnormally rich in proteids. According to Adami, the deposit of fibrin in peritoneal exudation is strictly comparable to the formation of thrombi inside blood-vessels, and it occurs only when the endothelium has undergone destruction and the roughened subendothelial tissues are exposed. Other observers have found fibrinous exudate lying upon a continuous layer of endothelial cells as the result of irritation or infection, and Buxton and Torrey found that almost immediately after the injection of inert particles into the peritoneal cavity of guinea-pigs a deposit of fibrin appeared on the surface of the omentum, and in this the particles and the phagocytic cells of the cavity became entangled. My own observations coincide with this view. Fibrin deposited on peritoneal surfaces may be dissolved as the result of bacterial activity, it may be absorbed by the cells and fluids of the body, and, lastly, it may form a framework on which new connective tissue is laid down. How often this last event occurs it is difficult to say, but it is probably rare except when foreign bodies are introduced into the peritoneal cavity. Fibrous adhesions can only be formed by the activity of fibroblasts, and the origin of fibroblasts in the peritoneal cavity is a question as yet unsettled. It is generally agreed that they are derived from preexisting connective-tissue cells, but in practice it is impossible to differentiate between young hyaline cells of a mononuclear type, endothelial cells, and newly grown connective-tissue cells. It seems probable, however, that there must be destruction of at least one serous surface for the production of fibrous adhesions. The researches of Graser are of interest in this connection, and according to his views of the agglutination of serous surfaces the peritoneal endothelial cells contribute to the formation of fibrin which glues the surfaces together; in this process the cells die and make way for the new tissue formed of blood-vessels and cells from the subendothelial layers. By using Weigert's fibrin stain he was able to trace fibrin formation even as far as the nuclei of the endothelial cells. To what extent *noninfective adhesions* are met with in clinical surgery it is impossible to say without bacteriological investigation, but experimentally they are readily formed around sterile foreign bodies introduced into the peritoneal cavity, and when these are removed adhesions almost invariably re-form. The technic of my operations has been as follows: the hair has been removed with a depilatory paste; the skin has next been painted with the tincture of iodine twice, and the abdomen opened forthwith; closure of the abdominal cavity has been effected with two continuous catgut sutures, one for the peritoneum and muscles, the other for the skin; iodine has been poured on after closure of the wound, and no dressings have been applied. The wound has almost invariably healed by first intention. In all cases the results have been controlled bacteriologically; the necessity for this is made obvious by the knowledge that an apparently aseptic and healthy peritoneum may sometimes yield positive cultural tests if a portion of the omentum be cut off and dropped into a broth tube under sterile conditions.

The organism grown in all cases was a white staphylococcus. Some authorities state that *sterile gauze placed in the peritoneal cavity* becomes firmly adherent within a few hours, but such is not my experience where small surgical sponges were used and the abdomen was closed. This is explained by the fact that such a sponge is free to move, and its position is being constantly altered by the peristalsis of the intestine, so that it was very rare to find the sponge occupying the situation in which it was originally placed. Another determining factor is the position of the sponge in relation to the omentum, but this will be considered later. In those cases where gauze is fixed in position, as in a drainage wound, fairly firm adhesions do form within a few hours, and they form more quickly in an infected than in a sterile wound. Sterilized sponges were placed in the peritoneal cavity of guinea-pigs and left in position for periods varying from one to six days. In every instance the sponge was found adherent to the omentum, not to the intestine, and the density of the adhesions was directly proportional to the length of the sponge's stay in the abdomen; after one day it was easily detached from the omentum; after six days the sponge was embedded in the omentum. In every case the sponge was saturated with blood-stained fluid, and from this films were made by gently squeezing the sponge, and these were treated with Leishman's stain. The cells present were red blood corpuscles, finely granular leukocytes, lymphocytes, and endothelial cells, and while red cells were always numerous the films exhibited a progressive proportional increase in both lymphocytes and endothelial cells. Further experiments were carried out on rabbits, and a number of sterile sponges were placed in different parts of the peritoneal cavity, being left *in situ* for varying periods. In a very large proportion of these cases the sponge was taken up by the omentum and was not adherent to the intestine, but where it had escaped the embrace of the omentum firm adhesions were found between sponge and bowel, or between sponge and solid organs. Pressure and peristaltic activity both played a part in the ultimate result, for in the case of sponges placed between the liver and the diaphragm the latter remained unattached, while the sponge was found partially embedded in the liver substance, so that only its upper surface lay exposed. Sponges which were placed in the pelvis were sometimes adherent only by that surface which was the lower in the customary attitude of the animal. If adhesions were present between intestine and sponge it was very rarely the small bowel which was implicated, and a reasonable explanation of this is afforded by the greater peristaltic activity of the small intestine. Both experimental and clinical observers agree that active peristalsis is antagonistic to the formation of peritoneal adhesions. In one experiment a sterile sponge was left in position for one month, and it had then become adherent to both small and large intestine. Microscopy revealed healthy gut with fibrosis of its serous coat, and a broad band of fibrous tissue passed between the sponge and the colon. Cultures from the sponge were sterile. Microscopical examination of these noninfective adhesions showed evidence of well-formed fibrous tissue after the

third day, and a specimen obtained seventy-two hours after a sponge had been placed between the diaphragm and the liver showed a horizontal palisade of fibroblasts over the congested liver capsule, and, on the distal side, masses of fibrin surrounding cotton fibers, with numbers of finely granular leukocytes and some endothelial cells.

*The value of the drainage-tube* in peritoneal wounds is at the present time being called in question, and a small number of experiments were carried out to ascertain what changes were induced by a sterile tube in the peritoneum. This does not accurately represent their clinical value, but with experimental animals it is impossible to proceed in the same manner as one does with human beings. The tubes were fixed in position and buried beneath the sutured abdominal wall; lateral openings were closed in a very short time, and in twenty-four hours the whole of the tube was plastered over with newly formed tissue consisting of fibrin containing numbers of red blood corpuscles and degenerated finely granular leukocytes. This tends to show that tube-drainage of the peritoneum, unless there is an abscess cavity with well-defined walls, is of very limited value, and my impression is that in septic cases the presence of a tube may, by its pressure, favor the transmigration of organisms from the interior of the gut to the infected area; and this view is supported by the clinical observation that there is often very little discharge until the third or fourth day after operation, when by the action of organisms, leukocytes, and the body fluids liquefaction of the inflammatory tissue will have taken place. It is well known that if cultures be taken from drainage tubes which have remained in abdominal wounds for some days the bacillus proteus and bacillus pyocyaneus are often present, even in cases where they were absent at the operation, and these organisms are common inhabitants of the intestinal canal.

The opinion has been stated that to leave any *blood in the peritoneal cavity* at the end of an operation is to invite the production of postoperative adhesions, but there seems to be very little evidence in favor of this view unless endothelial surfaces are grossly injured at the same operation. It is well known that in the immunization of animals intraperitoneal injection of large quantities of red cells, whether hetero-, iso-, or autogenous, is not followed by the formation of adhesions, and there is ample clinical and experimental evidence that the peritoneum is capable of absorbing large quantities of blood provided that the endothelial covering of the viscera is intact. Experimenting on rabbits intraperitoneal hemorrhage has been caused by puncture of the vena cava, by dividing arteries in the omentum, and by allowing vessels of the abdominal wall to bleed into the peritoneal cavity. The animals have been killed from two to ten days later, and, while the coils of intestine have been sticky and fibrin has been found up to the fifth or sixth day, a longer period than this has shown no evidence of adventitious fibrous tissue. In cases where there is a loss of peritoneal surface together with extravasated blood in the abdominal cavity it is possible that the fibrin of the blood may act to some extent as a scaffold on which fibrous adhesions are built up, but in a number of cases where the serous coat of the stomach has been



scraped away until free bleeding occurred there has been no evidence that small quantities of blood have this influence. It is possible that large quantities may do so, but another factor which then comes into play is the question of infection of the extravasated blood.

In the course of this investigation many methods have been utilized to induce fibrosis, but only one has proved invariably successful, and that is the introduction of sterile foreign bodies. After the removal of sponges adhesions have practically always been found between the omentum and bowel, or between intestinal coils only; to ensure the formation of the latter the omentum has been removed at the operation for insertion of the sponge. Other methods employed have been sacrifice of visceral surfaces and of the parietal peritoneum, the injection of chemical irritants, and of emulsions of sand and chalk. In the inoculation experiments the omentum always played an important part in the changes which occurred, and the results of intraperitoneal injection of 4 c.c. of a 15 per cent. sterilized emulsion of silver sand in guinea-pigs is of interest. Nine inoculations were performed on one day, and the peritoneum was examined at periods varying from three days to fourteen weeks. In every case there was a granulomatous mass on the parietal peritoneum containing particles of sand close to the injection puncture, and these areas, a quarter of an inch wide and raised slightly above the surrounding surface, were often multiple. In seven of the animals the omentum was lightly adherent to the granulomata, and the only two in which it was free were examined after thirty-seven and ninety-five days respectively. In the last case it appeared that the peritoneum had recovered from the irritation, since there was scarring, but the granulomata were very small. In six instances a portion of the omentum was cut off at the postmortem and dropped into a broth tube; five of these were sterile; the sixth gave a pure culture of a staphylococcus albus, and in this animal the omentum was found plastered over the surface of the liver. In two cases definite fine bands of fibrous tissue were present in addition to omental adhesions. Similar experiments were carried out on rabbits, the sand emulsion being introduced by open operation. After eleven days the parietal peritoneum was studded with nodules of a grey-yellow color, raised about a quarter of an inch above the surface, and similar nodules with pointed tags were present on the large intestine; the small bowel was entirely free from these granulomata. After twenty days it was found that definite fibrous bands passed from the colon to the parietal peritoneum. Microscopy of the inflammatory tags found after eleven days revealed connective-tissue cells arranged in whorls and surrounded by fibrous tissue; in the central parts of the section giant cells were seen, and between the true fibrous tissue and the connective-tissue cells numbers of elongated oval fibroblasts were present. The absence of blood-vessels was striking. Chemical irritants were found to be much less reliable in the production of adhesions, although they caused marked endothelial proliferation, excess of exudation, and occasionally fibrinous agglutination of the viscera. The effect of scarlet red, which is commonly recognized as a cell proliferant, was absolutely negative as a

producer of peritoneal adhesions. With regard to scarification of serous surfaces an attempt was made in a number of experiments to ascertain whether intact peritoneum readily adheres to raw areas, or whether two raw surfaces are required to ensure the formation of adhesions. It was found, in the first place, that merely rubbing an endothelial surface with sterilized gauze was not to be relied upon to excite such cellular proliferation, and that such irritation could be rapidly recovered from without showing any definite traces of injury or repair. Secondly, linear scarification with the point of a scalpel was often repaired with very little evidence of change. Lastly, that where definite areas of the wall of the stomach or colon where denuded of their peritoneal coat it was almost certain that the omentum would become adherent if the bare area lay within its field of excursion.

*The functions of the omentum* have for many years been a subject of speculation, but recently this organ has been credited with remarkable and important properties, and this view appears to be justified. The pathologist was perhaps the first to realize its immense value in localizing inflammatory lesions within the peritoneal cavity, and surgeons have also learned to respect its integrity and do not now remove it as ruthlessly as in former years. Its power of repelling bacterial invasion has been amply proved by comparing the results of intra-peritoneal inoculations with bacterial cultures in the case of animals with or without omenta. Its power of absorption of foreign particles and of bacterial products is also well known. Dunsmoor states that in human beings the omentum is capable of taking up 0.5 per cent. of the body weight of fluids per hour, and that this absorptive power is proportional to the activity of intestinal peristalsis. Buxton and Torrey found that almost immediately after the intraperitoneal injection of inert particles, such as lampblack, in guinea-pigs, there is a deposit of fibrin on the surface of the omentum in which the particles and phagocytic cells of the cavity become entangled, and one hour after the injection the lymphatic channels of the omentum were filled with particles of lampblack, so that these lymphatics must be regarded as second only to those of the diaphragm in their capacity for absorption. The reaction on the part of the omentum to irritation is also called forth by the existence of raw areas on peritoneal surfaces, and it appears to play an important part in the repair of such surfaces. Its faculty for reaching and protecting these dangerous areas is remarkable, and no better example of this function can be cited than that met with after simple laparotomy. In a large number of cases the omentum, both in the human being and in experimental animals, is found firmly or lightly adherent to the abdominal wall, and my impression after examining a large number of such wounds at very varying periods after the operation is that in nearly all cases where a large gap is left in the parietal peritoneum in the upper abdomen within range of the omentum this organ becomes adherent. In many cases of ordinary closure of the peritoneal cavity where satisfactory apposition is secured omental adhesions are also met with. The questions to be decided are whether such adhesions are accidental, and also whether they

serve any useful purpose. With regard to the first point, their occurrence appears to depend largely on the extent of the gap in the peritoneum on the posterior aspect of the wound, and from experience of upper abdominal wounds in man and animals it would seem that such adhesions are almost inevitable where the peritoneum is imperfectly closed by suture. As to the value of these adhesions, it is probable that in many cases they are only temporary and that they represent one stage of an autoplasmic omental graft by which the healing of a peritoneal ulcer is facilitated and hastened. Such adherent omentum is capable of supplying numerous endothelial and connective-tissue cells to the bare area, and unless the omentum itself becomes fibrotic the adhesions apparently persist only until such time as the deep aspect of the abdominal wound is healed. This probably accounts for the fact that one finds adhesions of varying density, but this is by no means proportional to the length of time which has elapsed since the operation. A similar process probably takes place in the case of damaged endothelial surfaces of the viscera, and the release of the omentum may be explained by its motility. If these suggestions be correct and the omentum does contribute cells for the healing of these wounds, not the least of its functions must be that of the restoration of peritoneal surfaces. The powers of the omentum in relation to its protective and reparative properties are to some extent dependent on its motility. It appears to me absolutely certain that the omentum is entirely dependent for its movements on the peristaltic waves of the bowel to which it is attached and that which lies beneath it; further than this, that its movements are slow, and that inflamed or injured areas of peritoneum, though they often arrest the omentum until it becomes adherent at the damaged spot, do not attract it by any special chemiotactic or physical influence. Detached omentum left free within the peritoneal cavity does sometimes become adherent to the ligatured base of the organ, and in one case a portion of omentum was cut off and sutured to the inferior surface of the diaphragm, and four days later it was found that the stomach was rotated forward and upward, covered in front by a broad band of omentum from which a thickened cord ran to the lower end of the anchored omentum, but repetition of these experiments failed to establish the constancy of these results. One case is of especial interest because at the same operation the serous coat was detached from a portion of the colon and the lower half of the omentum was removed; the omental stump did become adherent to the colon but about one inch from this bare area, which was itself free from all adhesions showing no evidence of inflammatory repair. This animal was killed after only twenty-six hours, but the result suggests the absence of selective power on the part of the omentum since the bare area was easily within its reach. Frequently the lower two-thirds of the omentum have been detached and left free in the abdomen, but there has been no tendency for it to become adherent to the remainder. My investigations into *infective adhesions* have been directed to the study of the changes which followed the introduction of cotton-wool sponges inoculated with broth emulsions of agar

cultures of such organisms as the staphylococcus aureus and the bacillus coli from the macroscopic, microscopic, and bacteriological aspects. The last is of considerable interest, for it has been already pointed out that aseptic foreign bodies will give negative cultural results, even when they remain for weeks within a healthy peritoneal cavity, but in the case of infected sponges it is by no means certain that a pure infection with one organism will not become a mixed bacterial infection; in fact, it seems probable that such a change will occur. Using at first excessively small doses of the bacillus coli, it was found that adhesions developed more quickly than around aseptic foreign bodies, and the same organism was recovered in pure culture up to three days after the operation. With the staphylococcus aureus the adhesions were less dense, and in a case where one sponge was placed between the diaphragm and the liver, and another in the pelvis, the latter was free from adhesions, whereas the former was partially sunk into the upper surface of the liver. Cultures from the upper sponge were sterile, while from the lower an attenuated growth of a white staphylococcus was obtained. This appears to show the bactericidal action of the peritoneum and the superior power of absorption possessed by that covering the diaphragm. In this case only a single platinum loop of a twenty-four-hour broth culture of the organism was used, and the subsequent cultures were taken at the end of three days. Microscopically the adhesions present in these cases showed a fibrinous network with large numbers of finely granular leukocytes, and beneath this a narrow palisade of fibroblasts. When larger doses were employed the changes were correspondingly more extensive and more rapid, and several times starting with a sponge infected with a staphylococcus aureus the second bacteriological investigation yielded a growth of a bacillus as well as a coccus, and the added organism was either the bacillus coli or bacillus proteus. The explanation of this is that by infection and pressure the inoculated sponge had caused damage to the wall of the intestine, and this no longer formed an efficient barrier against infection from the lumen of the gut. A specimen, of which a lantern slide will be shown, exhibits the changes due to the presence of a sponge infected with 0.25 c.c. of a broth emulsion of a twenty-four-hour agar culture of the staphylococcus aureus; to the naked eye the sponge was seen to be surrounded by a thin layer of creamy white pus, and outside this there were coils of firmly adherent intestine with walls thickened and infiltrated; at one spot only did the mucous membrane show any trace of disease, and here there was an ulcer the size of a pin's head. Microscopically this portion of the intestine showed ulceration proceeding from serous to mucous coats, and the gap was filled up with inflammatory cells. This clearly represents a very early stage of fecal fistula, although cultures yielded a pure growth of the original organism.

In connection with infective adhesions the result of *applying pure carbolic to the serous coat of the large intestine* is of interest. One drop of this chemical irritant was applied on the point of a pair of artery forceps to an area, half an inch in diameter, of the surface of the

colon, and also to several smaller spots on both large and small intestine. The serosa became white and lost its polish, but it still moved freely on the subjacent muscle; the omentum was not touched. The abdomen was reopened at the end of a week; the small intestine showed no change, and all traces of the caustic had disappeared. In the case of the large bowel several small areas showed thickening and proliferation of inflammatory origin similar to that seen after scarification with the point of a scalpel. At one spot, corresponding to the larger area of carbolic cauterization, a very vascular band of omentum was adherent. A portion of this was excised and dropped into a broth tube; a pure growth of the bacillus coli was obtained. The adhesion was not divided until three weeks after the first operation, and the bacillus coli was still present. Microscopically this omental adhesion consisted of whorls of fibrous tissue of considerable density with blood spaces and newly formed vessels. Excision of nearly the whole of this band failed to prevent its forming again, but when the animal was killed two months after the first operation cultures from the re-formed omental band proved to be sterile. In this case it appears probable that the adhesion was largely due to the presence of the colon bacillus, which had passed through the damaged serous coat of the gut, and although the infection gradually died out its ill results remained in the form of permanent fibrous tissue. Allusion has already been made to the possible secondary infections which may result from the presence of foreign bodies, such as drainage tubes, exerting harmful pressure in infected regions of the peritoneal cavity. As regards the persistence of infective adhesions, clinical experience teaches one that they may disappear with great rapidity, and yet in other cases they may be found years after peritoneal infection. In this connection it is essential to differentiate clearly between fibrinous and fibrous adhesions, for there is no doubt that the former often appear and disappear in a few days, whereas the latter possess great powers of resistance against the action of bacteria, leukocytes, and the body fluids, and they are met with when the organisms are sufficiently powerful to kill at least a large proportion of the endothelial cells.

*The treatment of peritoneal adhesions.*—Having gained some knowledge of the circumstances which govern the formation and the persistence of adhesions within the peritoneal cavity, an endeavor has been made to prevent them, and to cure them when present, and it appears to me that in this matter prevention is not only better, but easier, than cure. In an excellent paper by Richardson a *résumé* of the methods which have been adopted are given; his list includes: 1. The use of nonabsorbable protective membranes, such as collodion film, sheets of silk or rubber fabric, silver foil, etc. 2. Manual and postural arrangement of the viscera. 3. Stimulation of peristalsis. 4. Specific drugs, such as iodides, and fibrolysin. 5. Normal salt solution in large quantities with the addition of adrenalin to constrict vessels and limit exudation. 6. Introduction of gases. Distension with oxygen just prior to closure of the abdomen. 7. Hot air baths. The induction of intraabdominal hyperemia



by the local application of hot air baths to the lower part of the trunk. 8. Eschar of the thermocautery. Deep cauterization is said to have some advantages. 9. Lubricants. Olive oil, vaseline oil, liquid lanoline, liquid paraffin, and special fats of animal origin. 10. Nonviable animal membranes, such as Cargile membrane, ox peritoneum, gold-beater's skin, etc. 11. Viable grafts. The omentum. Richardson concludes by describing a method of covering raw surfaces on the intestinal wall by raising a flap from its adjacent mesentery, pulling it down over the bowel and securing it over the denuded area with a few sutures. In the present investigations only some of these methods have been employed in the treatment of adhesions. In the first place, it is generally recognized that foreign bodies such as rubber fabric or even membranes have yielded disappointing clinical results, and therefore these have not been tried. As regards the stimulation of peristalsis to prevent the formation of adhesions, such a course is clearly of value, and rarely have these experimental adhesions involved the small intestine unless the process was due to infection, so that rapidity of peristalsis must be considered to militate against the formation of adhesions. Clinical experience is in favor of the use of eserine, and many experimental observations confirm this view, and several writers state that beetroot, which in rabbits causes peristaltic activity, has a value in preventing the formation of peritoneal adhesions. With regard to drugs I am at present engaged in investigating the action of fibrolysin on adhesions within the peritoneal cavity, but as yet no definite conclusions have been arrived at. Of the other methods enumerated by Richardson, attention has been directed to lubricants and viable grafts of the omentum, and these methods must be considered in detail. In the investigation of infective adhesions I have observed on one or two occasions in human beings that secondary hemorrhage has had a most beneficial effect on the condition of the peritoneum. I have therefore, in rabbits, produced a localized abscess, evacuated its pus, filled the cavity with blood serum from the same animal, and then closed it. This has been followed by good results so far as the peritoneum was concerned, but in all cases there was considerable infection of the abdominal wall, and thus it is difficult to estimate the value of the procedure where one uses experimental animals, but such a method may be worthy of trial in the case of human beings with localized peritoneal suppuration.

It has been held that such lubricants as *sterilized olive oil and liquid paraffin* facilitate peristalsis, prevent friction, and serve to separate raw areas during the healing of the damaged peritoneum, and therefore they have been recommended for the prevention of adhesions both in cases where their formation is likely and in those where they have been broken down to prevent their reappearance. Experimentally, however, these fluids have not proved to be of much value. Sterilized olive oil has been used to prevent the formation of adhesions around rubber drainage-tubes and liquid paraffin to obviate recurrence after enterolysis; neither procedure has been



successful, for tubes soaked in oil have become more adherent than tubes without oil placed in the same abdomen, and the paraffin has not prevented the reformation of divided adhesions. A new lubricant has been advocated by Crump, prepared from the omentum and appendices epiploicæ taken from animals a few minutes after death. He has used it in a good many clinical cases where adhesions had to be broken down at the operation, and he records good results, but does not present any operative evidence that these adhesions were especially influenced by the use of his oil. Wilkie used sterilized vaseline oil to prevent adhesions, and experimentally he found cream-cheese-like masses in the abdomen and advised against its use.

Ever since the brilliant researches of Nicolas Senn were published in 1888 it has been known that the *omentum may be used as a covering for denuded areas of peritoneal surfaces* and for the closure of perforations, and, bearing in mind the use which Nature makes of the omentum in this direction, it would appear to be the duty of the surgeon to imitate the natural processes of repair as closely as possible. On many occasions the omentum of the rabbit has been completely detached and left loose in the peritoneal cavity. Invariably it has been found free from adhesions, and usually rolled up into a ball by the peristalsis of the intestine. Microscopical examination has revealed some proliferation of its endothelial covering, together with slight fibrosis, but almost no necrosis of its fatty tissue. If, then, the omentum is capable of existing, deprived of its blood supply, on the fluids of the peritoneal cavity, it is clear that we have an ideal natural covering for denuded surfaces. Senn began his omental grafting by using portions which were still attached at their base, but this is open to obvious objections, for the omentum may act as a band and produce intestinal obstruction. He therefore next used portions of omentum completely detached; these he placed in 1 in 2,000 corrosive sublimate solution, and then partially dried them between layers of gauze wrung out of the same solution. These grafts were applied to the surface of the intestine in animals and became firmly adherent in from twelve to eighteen hours, and freely supplied with blood-vessels in from eighteen to forty-eight hours. A point in his investigations which is of some interest is that he found that if he scarified the wall of the bowel before applying the graft healing was quicker and firmer. His grafts were secured by two or three fine catgut stitches, and in many cases he used omental grafts to encircle the line of an intestinal anastomosis. Since this date omental grafting has been made use of by many surgeons to reinforce suture lines in the bowel wall and to cover denuded areas, but the results have not been uniformly good, and for this reason some discredit has been thrown upon such grafting. The explanation of such failures is probably to be found in the fact that they have frequently been used in infected areas, and under these circumstances there is no reason why a covering of omentum should prevent adhesions, which are the outcome of inflammatory reaction of the irritated and dam-

aged endothelial or subendothelial surfaces. It is well known that the operation of hysterectomy is apt to be followed by adhesions between intestine and the stump of the uterus unless the greatest care is taken to unite the peritoneum over the stump, and since this operation does not involve the bowel it is usually free from any infection. This procedure has been selected by me for experimental proof of the value of omental grafting, and the results have been uniformly good, for where no omental covering has been applied to the uterine stump some adhesions have always occurred, but this has been prevented by the application of a detached omental graft. Nearly the whole of the omentum of the rabbit has been utilized for this purpose, and no harm has resulted as regards the blood supply of the stomach. It is hardly necessary to say that no antiseptics have been used within the peritoneal cavity or in preparation of the graft. In the human being only small portions of omentum would be required for such a purpose. There are certain abdominal operations in which the surgeon welcomes, and even depends upon, the rapid formation of adhesions, and one may quote as examples the formation of artificial anus, operations for ascites, and intestinal anastomosis. As regards the first, the endothelial surface of the bowel is usually brought up firmly against the edge of the parietal peritoneum and the freshly divided muscles and fascia of the abdominal wall; sufficient irritation and injury result from this to ensure agglutination within a few minutes and firm adhesions within a few hours, and the sutures which are applied suffice to hold the bowel in place in spite of the strain of vomiting and involuntary movements of the patient.

A well-known method of operating for ascites due to portal obstruction consists in rubbing the inferior aspect of the diaphragm and the superior surface of the liver with sterilized gauze to induce adhesions between the liver and diaphragm, and thus set up a collateral circulation. Although this often succeeds it appears to be somewhat uncertain, for whereas scarification increases the chance of adhesive union of endothelial surfaces, yet some observers have even rubbed parietal and visceral peritoneum with a tooth-brush and a few days later the surfaces have become smooth and polished, so that to be certain of adhesions a foreign body, such as sterilized gauze, should be left *in situ* between liver and diaphragm until the second or third day, when we know that fibroblasts will have appeared in the inflammatory tissue. Intestinal anastomosis presents special features of interest, and a series of microscopical sections of anastomotic junctions in human beings at various periods after operation have been examined to ascertain the fate of the sutures and the precise method of healing which takes place. It is well known that if two portions of bowel obtained from the postmortem room be accurately sutured together, either by axial or lateral anastomosis, water under moderate pressure can be passed through the junction immediately. It is also known that the submucous coat is one of the most important factors in the healing of an anastomotic wound; it is apparently in this tissue that the suture gets its firmest hold. It is

commonly stated that in order to obtain satisfactory healing one must secure accurate apposition of the serous surfaces, but microscopical examination of successful anastomoses has shown that the serous coat of one portion of intestine may be lying directly against the mucous coat of the other portion, that approximation is sufficient to insure against extravasation of fecal matter, and that the greatest risk is that of infection from the sutures themselves. The water test can be satisfactorily carried out with intestine which shows no trace of healing, and the earliest change observed is a plug of fibrin which occupies the angle between the serous coats of the anastomosed portions of intestine. This is present in healthy bowel within an hour or two of the operation, and it appears to form a scaffold for the further changes of endothelial proliferation and fibrosis proceeding from whichever parts of the bowel are actually in apposition. Stitches rapidly disappear into the lumen of the gut, excepting those portions of the Lembert sutures which lie in the muscular coat, and these undergo some degree of encapsulation. Healing of the mucosa is the last change to occur, and this appears to take at least three weeks in most forms of intestinal anastomosis. It would appear that scarification of the serous coats before anastomosis is calculated to promote more rapid and firmer healing than where one relies entirely upon the irritation set up by the presence of sutures and the pressure of approximation for closure of the anastomotic junction. That reinforcement of suture lines with omental grafts is not usually needed in intestinal anastomosis is generally agreed, and an obvious objection to their use lies in the fact that these are infected operations; nevertheless, on many occasions they have proved of value, and occasionally the continuity of the intestinal tube has been secured by wrapping omentum around the suture line, and such a step might reduce the existing high mortality of anastomosis in acute obstruction, a procedure which the surgeon is sometimes compelled to carry out owing to the risks attached to the production of an artificial anus in the small intestine, for the mortality is probably due in a large proportion of cases to the presence of infected sutures.

**Results with Rubber Gloves from the Clinical and Bacteriological Standpoint.**—Hellendall and Fromme (*Zentralbl. f. Gynäk.*, Nov. 30, 1912) have made a careful examination of the hands and gloves in a series of ninety major operations in which these are employed, for the purpose of determining whether the production and the collection of the excretions from the skin in the gloves could be neglected as a factor in the aseptic treatment of wounds. They find that even when gloves are used dry a moisture is usually deposited which contains a considerable number of germs, even where the hands have been carefully disinfected by the hot-water and alcohol methods. For this reason openings in the dry gloves are not less dangerous than where these are put on wet, so that the possibility of wound infection is present in every case. It seems questionable therefore whether the production of germs can be arrested by the application of 7 per cent. alcohol and keeping the hands dry. The

authors found that the addition of corrosive sublimate to this method of hand sterilization reduced the danger of the skin excretions where dry gloves were employed. They believe, moreover, that the use of cotton gloves with the dry rubber gloves will serve to increase the protection. It was also found that certain persons are more liable to be troubled by excretion from the skin of the hand than others.

**The Middle Ground in the Treatment of Eclampsia.**—Engelmann (*Zentralbl. f. Gynäk.*, Nov. 9, 1912) argues for a more rational therapy in the treatment of this condition, claiming that the results of both conservative and radical treatment indicate that we must pursue a method which takes in the good qualities of both. As the result of his personal experience in the Gynecological Clinic at Dortmund, he has found an undoubted improvement in the statistics since early delivery has been abandoned as the principle method of treatment. Out of fifty-three cases treated in the last two and a half years, six (11.3 per cent. ended fatally, or five (10.8 per cent.) out of forty-six which were observed before delivery. In the last twenty cases, however, in which early delivery was entirely excluded, only one case was lost. The treatment employed consisted of the following: Isolation of the patient; avoidance of external irritants; examinations, etc., conducted under chloroform; venesection, followed by infusion, repeated if necessary; regular administration of chloral hydrate per rectum; inducing or hastening labor by rupture of the membranes or gradual dilatation of the cervix with bags; operative delivery in the presence of immediate danger. Engelmann believes that vaginal Cesarean section demands great technical skill and especially in primipara cannot be regarded as a harmless procedure with an undoubted favorable prognosis. It ought under no circumstance be carried out anywhere else but in a hospital and with skilled attendants. The writer believes that venesection has a three-fold value—it frees the organism of a certain amount of toxin, it markedly diminishes blood pressure, and assists in restoring the activity of the kidneys. Not less than 500 cubic centimeters of blood should be abstracted and this may be repeated if necessary. As the result of his personal observations, Engelmann is convinced that the physical changes in the character of the blood constitute an important rôle in the pathology of eclampsia. This refers particularly to the viscosity, which he thinks is increased to correspond with the increase in the coagulation power.

**Pituitrin as an Ecboic, Especially in Placenta Previa.**—E. Haugh and Leopold Meyer (*Arch. mens. d'obst. et de gyn.*, Oct., 1912) have made use of pituitrin to increase uterine contraction in inertia uteri. They found it of considerable value in secondary inertia, pains having existed and become slight, but as an excitant of contractions which had not begun it was found useless. They employed it in all in sixty-five cases, by subcutaneous injection. It is important not to wash the skin or the hypodermic needle with alcohol before making the injection, as alcohol destroys the effectiveness of the extract. There were no disagreeable accidents from its use

in any case treated by the authors. Its value is less the nearer the time is to the beginning of pregnancy. When preceded by a long labor it has the best effect in increasing contractions. In the second stage of labor its best work is shown, while in the expulsive stage there is little benefit from its use. In contracted pelvis it should not be used unless there is but slight disproportion between the head and the pelvis. When the fetus suffers from the length of labor it is helpful. In placenta previa combined with the rupture of the membranes, provided that the hemorrhage has not been so great as to exsanguinate the patient, the delivery is hastened sufficiently to allow of delivery without version.

**Surgical Treatment of Hemorrhages of Pregnancy, Labor, and the Puerperal State.**—Paul Bar (*Arch. mens. d'obst. et de gyn.*, Oct., 1912) considers the treatment of hemorrhages due to vicious insertion of the placenta, to hemorrhage behind the placenta, and hemorrhages of delivery. From the records of the Hôpital St. Antoine the author has collected records of 153 cases of hemorrhage due to placenta previa, frankly attached over the os, severe enough to necessitate intervention. All were delivered by some sort of extraction without a surgical operation. The mortality for the mothers was 9.2 per cent., most of the deaths being due to sepsis, not directly to the hemorrhage. There is far less risk of death from anemia due to hemorrhage than from sepsis. Of course in many cases the examinations and the hastily taken means of delivery have exposed the woman to chances of infection, often before she had reached the hospital. There is little risk of death from hemorrhage after tamponade unless a fresh and fatal hemorrhage is caused at the time of delivery. The author believes that we should always interfere to hasten delivery when there is risk of infection, and if we believe that infection has already occurred interference should be only through the vagina. If there is no infection present sometimes the abdominal, sometimes the vaginal, route is to be preferred. When the cervix is dilatable the use of balloons with version is preferable; but if the cervix is nondilatable, and hemorrhage urgent, a vaginal Cesarean section is indicated in infected cases. If no infection is present the classical Cesarean section can be performed. In retroplacental hemorrhage the gravity of the condition depends on the amount of blood contained in the hematoma. A rapid delivery becomes necessary. There is a varying degree of infiltration of the uterine tissues. In case of small hematoma there is still danger of infection of the uterus. If there is sufficient dilatation to make vaginal delivery possible the author uses this method; if not, a classical Cesarean section is made. Hemorrhages during delivery seldom need surgical interference.

**Total Hysterectomy as Treatment for Cancer of the Cervix Uteri in Pregnancy.**—M. Levant (*Arch. mens. d'obst. et de gyn.*, Oct., 1912) says that the treatment of cancer by hysterectomy during pregnancy, labor, and the puerperal state is of recent origin. Formerly cancer was considered inoperable during pregnancy. Opinion is unanimous at the present time that operation should



be done at once in all operable cases. The question of operability depends on the manner in which the cancer has infiltrated the surrounding tissues. In cancer of the mucous membrane extending into the vagina the spread is comparatively slow; while in cancer of the cervical canal the spread is rapid toward the base of the broad ligament. Cancer of the vaginal portion of the cervix spreads downward; cancer of the cervical canal, upward. If the cancer extends onto the wall of the vagina its removal is easy. If it spreads into the wall of the bladder operation becomes impossible. If the ureters are involved little can be done. The loss of uterine mobility is an indication that the inoperable stage has been reached. As long as the cervix can be drawn upon bringing the whole organ downward, operation can be attempted, since the tissues are not so far infiltrated as to make the extent of involvement too great for removal. In the pregnant woman the appreciation of the mobility becomes more difficult; the existence of indurated nodules at the base of the broad ligaments, even if the cervix is movable, shows that involvement is too great for removal. If this does not exist we should operate early. To wait until the child is viable will allow of rapid extension, which occurs during pregnancy, until operation cannot be done successfully. We should first consider the interests of the mother and second, those of the child. When labor has begun and delivery has been accomplished by Cesarean section total hysterectomy can be done at once. The author prefers abdominal to vaginal hysterectomy.

**Phenolsulphonephthalein Test for Estimating Renal Function in Pregnancy.**—F. E. Sondern and T. W. Harvey (*Bull. Lying-In Hosp.*, 1912, viii, 172) have made examinations late in pregnancy in eighteen clinically normal cases, all of those remaining in the hospital having had a subsequent normal delivery. In all those patients a nitrogen retention, if a relatively diminished excretion may be so termed, existed on the basis of this phenolsulphonephthalein test. The time of appearance of the drug varied from eight to thirty minutes with an average of a little over twelve minutes. Excretion in the first hour varied from 42 to 15 per cent. with an average of 26 per cent. Excretion in the second hour varied from 32 to 2 per cent. with an average of 19 per cent. Excretion in two hours varied from 58 to 21 per cent. with an average of 45 per cent. These figures suggest that the depression in nitrogen excretion at this stage of pregnancy may be due to interference in renal function. In the absence of actual renal lesions the inference seems fair that the cause may be sought in disturbed kidney circulation due to pressure of the gravid uterus. The table also corroborates the belief that delayed appearance of the drug does not necessarily mean insufficient excretion or that prompt appearance indicates normal excretion. The amount excreted is the important factor in determining renal functional ability.

**Relation of the Thyroid to Pregnancy and the Puerperal State.**—Among 1000 cases observed by J. W. Markoe and L. A. Wing (*Bull. Lying-In Hosp.*, 1912, viii, 153), of whom 550 were primiparæ



and 450 multiparæ, ninety-seven cases of enlarged thyroid were found in sixty-four primiparæ and thirty-three multiparæ. A family history of goiter was present in eight cases (seven primiparæ; one multipara). In six primiparæ there was a history of menstrual disturbance. Hyperthyroidism was present in varying degrees in seven cases and probably in one other case, although there was no palpable thyroid in this case. Among the sixty-four primiparæ, twelve occurred before pregnancy, six of these in childhood, three at the onset of menstruation and three between menstruation and marriage; eighteen commenced during pregnancy. In thirty-four cases the patients were observed at about term and the thyroid found enlarged. The patients had not observed any changes in the neck. It is probable that in the majority of these cases the thyroid enlargement began sometime during pregnancy. Of eight cases in multiparæ beginning before pregnancy, four were observed at puberty and four between that time and marriage. Twelve cases were first noted during pregnancy and there were thirteen of unknown onset, but probably beginning during pregnancy.

#### GYNECOLOGY AND ABDOMINAL SURGERY.

**Radiotherapy in Uterine Fibromata.**—M. Heller (*Arch. mens. d'obst. et de gyn.*, Sept., 1912) says that it seems to be proven that in some cases of uterine fibromata radiotherapy has given good results. Although this method of treatment is not the panacea that was at first supposed, little by little its field has been circumscribed until we now have precise indications for its use. There are certain complications attached to its use. There are several methods of application of the rays, over the ovaries or the uterus, or both, each of which has its value. It has a marked effect on the hemorrhages accompanying fibromata and on the ovarian glandular tissues, especially about the time of the menopause. In younger women its action is only temporary. In some cases there is a marked diminution in size of the tumor. A notable change for the better occurs in the general condition of the patient, due to arrest of the hemorrhages, and lessened compression. The effect of the rays is due to the sterilizing action on the ovaries causing atrophy and thus an indirect effect on the tumor; and to direct action on the fibers of the tumor itself. Some authors admit an effect on the glandular cells of the uterine mucosa and the sarcoplasm. The best effects are secured at about the menopause, when a relatively small dose will cause ovarian atrophy. Below forty years of age there are some failures due to regeneration of the ovary.

**Sponge Compression in the Treatment of Mammary Abscess.**—J. E. Dearden (*Amer. Jour. Surg.*, 1912, xxvi, 356) says that as soon as fluctuation is evident the abscess should be opened and treated in the manner known as Mundé's sponge compress method. A large, flat, coarse bathing sponge is hollowed to admit the mamma; it is freed from foreign matter and treated

to a hot carbolic-acid bath. The abscess is opened over the seat of fluctuation by an incision radiating from the nipple, the pus is evacuated and the abscess cavity is washed out with a mild antiseptic solution or saline solution. The sponge is dipped in sterile or carbolized water, as hot as the hand can bear, and wrung out in a towel. It is now placed over the breast, the walls of the cavity being held in apposition, is covered with oiled silk and is evenly and firmly compressed against the thorax with wide rubber bandages. This dressing is changed daily, the sponge being cleaned, but the abscess cavity is not interfered with. Its walls are held in apposition, inducing fresh granulations to unite and thus close the cavity. It is indispensable that there should be uniform, even compression of the breast from the periphery toward the center and from the surface toward the thoracic wall. A breast treated in this manner will be ready to resume its function in from seven to ten days.

**Environmental Arrest of Development.**—C. P. Noble (*Amer. Pract.*, 1912, xlv, 559) says that mankind must be divided into three series: 1. Those of sound stock and of good constitution. 2. Those having environmental developmental arrests—instances of environmental developmental hypoplasia. 3. Those having hereditary arrests of development, due to specific defects in the germ plasm of their ancestors. That which characterizes the entire series of environmental evolutionary degenerates is weakness, or an organism more lowly vitalized than is typical for humanity. The characteristic figure of those having evolutionary hypoplasia of environmental origin is marked by a relative increase in length and capacity of those parts of the body which are the least vital or important, and by a relative decrease in length and capacity of those parts of the body which are most vital. They do not stand erect. The head is relatively bowed, the curves of the vertebral column are altered, the shoulders droop forward, and the chest is flattened; because the ligaments and the muscles upon which the characteristic posture of the body depends are atonic, and thus do not typically counteract the influence of gravity. There is a tendency to the development of "pot-belly" following parturition, if not independent of it. The gait is shambling or shuffling, and all their movements are relatively slow. In a general way, the figure and the characteristics of environmental evolutionary degenerates correspond with that of the hereditary consumptive. This figure and this type of constitution makes up at least one-third of those having American ancestry, for at least three generations, in the northeastern part of the United States. The relative lack of vigor or vital energy which characterizes them before puberty is equally manifest during adolescence and in after life. They are relatively shy, and hence do not take part in the usual manner in the accustomed sports or diversions of girls of their age. Their nervous system is relatively unstable. They lack concentration and are incapable of doing full work, and, if they attempt it, they break down with either nervous prostration, hysteria, chorea, or

functional diseases of the glandular organs. The sex instinct in them is deficient; in them are found the so-called frigid women—who make up approximately 33 per cent. of the women having American ancestry in the northeastern part of the United States—the “New Woman.” In addition to chlorosis, occurring most frequently between the ages of eleven and fifteen, and chorea, occurring at any time from childhood on to adult age, and the development of adenoids in the nasopharynx, and enlarged pharyngeal tonsils, the most common morbid states which develop in environmental developmental degenerates are delayed and irregular menstruation, dysmenorrhea, leukorrhea, menorrhagia, various neuralgic aches and pains, due either to toxemia, or to malnutrition, or to strains, causing pain in lowly vitalized or atonic ligaments, and functional disorders of the various special organs, including refractive errors in the eyes, vasomotor disturbances in the nose and in various other organs, hysteria and neurasthenia, and finally chronic invalidism of an asthenic type. As a group they are sterile or relatively sterile. When impregnation occurs the various disorders of pregnancy commonly follow, such as hyperemesis gravidarum and puerperal eclampsia. As their nervous, muscular, and osseous systems are relatively arrested or undeveloped, labor pains are weak, painful, and ineffectual, and commonly such women become exhausted before delivery is effected. Postpartum hemorrhage is a more common sequela than in the average of labors. Lacerations of the cervix and perineum, postpartum infection and infection of the bladder if catheterization is necessary are relatively common. Subinvolution commonly follows labor. Malpositions or ptoses, or hernia of the pelvic organs are relatively common after labor in environmental degenerates.

**Lateral Hematocolpos in Cases of Malformation of Uterus and Vagina.**—Vautrin (*Ann. de gyn. et d'obst.*, Aug., 1912) says that we meet with lateral hematocolpos in cases in which there is a malformation of the uterus, two canals occurring, with two vaginæ, one of them only partially developed. The partially developed vagina may have a cavity corresponding only to the cervical region, or it may extend partly downward toward the vulva, the corresponding uterus opening into a closed cavity. When menstruation begins the fluid flows into this closed vaginal cavity, and distends it, while between the menstrual periods the fluid is more or less completely absorbed. When the vagina is developed in its lower part the teratological explanation of the condition is easy: the two canals of Müller did not coalesce, and thus two tubes were formed. As long as there is no menstrual activity of the second uterine cavity there is no reason to suspect the existence of the second vagina. But when menstruation occurs an elastic swelling appears at the side or upper part of the normal vagina, projecting into its lumen and constricting the normal vagina. Menstruation in this vagina may be synchronous with that of the normally developed side or not. If only the upper portion of the malformed vagina exists we may have an irregular sacculation, or a sac which projects but

little into the vagina, spreading out within the pelvis. The author gives histories of two cases treated by him. The menstrual blood that flows into the closed sac cannot penetrate back into the uterus on account of the resistance of the cervical muscle, and thus no ascending infection occurs as long as the cavity remains closed. An exalted virulence of the pus which eventually replaces the bloody fluid, infection from the blood, or menstrual troubles sooner or later cause an ascending infection into the uterine cavity and tubes to take place. As soon as the sac is ruptured by pressure or puncture infection from without occurs and a pyocolpos results. The wall of the hematocolpos becomes modified by inflammation into a thickened, sclerosed tissue, fatty and without elasticity. The vagina may be divided into irregular divisions which destroy all parallelism with the vagina, having thin walls. The symptoms of this deformity are pain occurring about puberty due to the stretching of the cavity by the fluid descending into it. This lasts until menstruation ceases, and then stops. After menstruation has occurred repeatedly the vagina becomes dilated and distended with fluid, pain increases, and is colicky, lasting several days. If the hematocolpos is acute there are fever, and local congestion and a tumor appears. When the collection of fluid is large it may compress the bladder and render micturition difficult. Examination shows the presence of a tumor, tender, elastic, and regular if the deformity includes the whole vagina, irregular when it does not. The difficulties of diagnosis are due to the rarity of the deformity, which is not expected by the practitioner. Spontaneous rupture may take place, the fluid empty itself, and the opening close after infection from without has occurred. Pyocolpos always ensues after a time, with a resulting endometritis and salpingitis. The normal second uterus may also become infected, and a very serious condition eventually be fatal. The prognosis without surgical intervention is altogether bad. Simple puncture is only palliative, and a cause of exogenous infection. Removal of the deformed vagina and one-half of the double uterus is the only treatment that will give hope of cure. If both sides of the uterus have become infected a total hysterectomy becomes a necessity, often with salpingectomy and ovarian castration.

**Surgical Treatment of Cancer of the Cervix Uteri.**—J. L. Faure (*Arch. mens. d'obst. et de gyn.*, Oct., 1912) gives his results from the treatment of 250 cases of cancer of the cervix by surgical methods. He considers the operation of preference to be abdominal hysterectomy, with removal of the uterus, upper part of the vagina, and pericervical tissues, even when these appear to be normal, all in one mass. He thinks that the removal of the entire contents of the pelvis with all swollen glands is entirely unnecessary. If there are glands which are manifestly diseased these should be removed, but many swollen glands return to a normal condition after removal of the ulcerating tissues, showing that their enlargement was simply inflammatory. That the results of the operation are permanent is shown by the fact that some of these cases have remained without recurrence for from five to ten years since the

operation. There is much difference in the success of this operation depending on the extent to which the disease had advanced at the time of operation. If disease involves only a portion of the cervix the prognosis is good; if the cervix is extensively diseased and the tissues about the organ infiltrated there can be no expectation of permanent good results. The author thinks that the mortality should be about 50 per cent. in these cases, including the advanced ones. In early cases cure without recurrence is the rule. Vaginal hysterectomy should be considered of less value because it gives less light on the seat of operation, which should be ample to get the best results. The hypogastriacs should be ligated to lessen hemorrhage, and give better view of the field of operation. Catheterization of the ureters is not necessary. Four of the author's cases were operated on during gestation, and the operation is rendered easier by the softening of the tissues due to pregnancy. The author thinks that radium has its place in the treatment of these cases. While he does not use it before operation, believing that its use hardens the tissues and makes their separation more difficult, he does consider it of value after operation in preventing recurrence.

**Cysts of the Vermiform Appendix.**—Pseudomyxoma of the peritoneum originating in the vermiform appendix is rare, only twelve cases having been reported, because the necessary antecedent conditions are rare. The cavity of the appendix must be cut off from the lumen of the cecum, usually by a cicatricial septum remaining from some old inflammatory condition; the cavity then becomes distended with mucus and a cyst of similar origin to a hydrosalpinx is formed. The immediate cause of cyst formation is obscure. In hydrosalpinx there is in the early stage usually inflammation, mild in degree, of the mucous lining of the Fallopian tube, while later on further distention is due to exudation of non-inflammatory nature along with atrophy of the mucous coat. In two vermiform cysts reported by T. Wilson (*Lancet*, Nov. 30, 1912) there was no sign of inflammatory change in the mucous lining. The appendical cyst with aseptic contents must be sufficiently free from adhesions to allow of its rupture or perforation into the open peritoneal cavity. The irritation caused by the presence of the gelatinous fluid is slight, so that it usually becomes encapsuled by recently formed delicate connective tissue. According to Trotter, the peritoneal endothelium in contact with the gelatinous effusion may persist and is apt then to become cubical or columnar, or it may grow over and cover in the foreign substance. Most observers have found scattered through the jelly chains of cubical or columnar cells; these have been supposed by some observers to be derived from the epithelial lining of the appendix, by others from the transformation of the peritoneal endothelium. Another origin is likely for many of them, which may be plasma cells engaged in the attempt to absorb the effused substance. The peritoneal changes are due either to attempts at absorption or to plastic inflammation of mild degree set up by the presence of the foreign material.



T. W. Eden (*Lancet*, Nov. 30, 1912) records a case of simultaneous and independent occurrence of pseudomyxomatous cysts of the ovary and the vermiform appendix. Perforation of the ovarian cyst had resulted in pseudomyxoma of the peritoneum.

**Myoma of the Cervix Uteri.**—M. Rabinovitz (*Surg., Gyn. and Obst.*, 1912, xv, 668) has collected 133 cases of cervical myoma, representing most of the available material recorded in the literature for the past twenty-six years. An analysis of the material thus gathered leads to the following clinical deductions: The etiology of cervical as well as of corporeal myoma is, in all probability, a perverted ovarian secretion, which may be termed a "myomhormone." This is evidenced by the fact that it occurs either in multiparæ becoming relatively sterile, or in the primarily sterile, or in the celibates, in all of whom the sexual energy, while still active, apparently finds an abnormal expression in the tumor development. The period of life most propitious for the growth of myomata is between the ages of thirty and forty-five. During this period procreation is usually on its downward course, but the other sexual manifestations, such as libido and menstruation, are still fairly active. This disturbance, in the relative proportion of the sexual gland functions, indicates a change in its metabolism, which suppresses fecundation, but is capable of calling forth a homologous or a heterologous tissue change and the formation of a tumor. Cervical myomata affect the posterior lip more frequently than the anterior lip. Cervical myoma is more often the cause of sterility than corporeal myoma. Abortion occurs less frequently in cervical myoma than in myoma of the body of the uterus. Dystocia is much graver and the results more serious in cervical myoma than in uterine myoma. Bladder and rectal disturbances, and neuralgic pains from pressure upon the sacral plexus, manifest themselves at an earlier period in cases of the cervical myoma than in the uterine. The diagnosis of cervical myoma offers greater difficulties than are presented by uterine myoma. The treatment of cervical myoma is radical removal, choosing the vaginal route for the intravaginal variety and the abdominal approach for the supravaginal growths.



# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### THE FUNCTION OF THE THYMUS GLAND.

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IF one turns over the pages of the text-books not only of physiology but of pathology, it is a remarkable fact that the thymus gland is given very scanty treatment. The reason for this is twofold: first, only in most recent times has the important rôle of the thymus in the harmonious course of the vital processes, especially in youth, been recognized; and second, there existed such a maze of theories and contradictory experimental results concerning this organ, in other words such a dearth of facts, that in this case silence seemed more serviceable than discussion. But on the basis of the fruitful thymus investigations of recent years we are now in a position to state the biological significance of the thymus, at least in its fundamentals. In this connection we should not forget that it was careful clinical observation at the bedside which brought the whole field of thymus research into systematic paths.

As early as 1614 we find frequent accounts of children who died suddenly, exhibiting shortness of breath and blueness of the face. The autopsy regularly revealed a large thymus gland, which was soon considered responsible for the previous sickness. Unfortunately we cannot here discuss the extremely interesting and instructive clinical history of the thymus with all its theories. We only wish to emphasize the fact that even up to recent times, the medical profession has stood helpless before these cases of such tragic aspect. Rehn was the first to recognize the surgical knife as the only salvation—the removal of the life-threatening organ. This proposition, which was soon translated into fact, was the means of setting for thymus research a definite problem: Is thymodectomy an operation

which is of indifference to the organism—in other words, what is the physiological significance of the thymus gland? This question we can to-day regard as practically solved.

In investigations on the thymus we have *a priori* two methods of procedure: First, we can consider the phylogenesis—whether or not differences are to be noted between animals with and without the thymus. The results of these researches would perhaps then permit conclusions of great importance concerning the function of this organ. Unfortunately this method has proven impractical, for the physiological development of the thymus is still veiled in darkness. We only know that Dohrn in his comparative anatomical studies was able to demonstrate the organ first in Selachians. We know further that in prehistoric fish the thymus formed an epithelial organ of the third gill slit. No investigation of sufficient exactness has been undertaken with the lowest amniotes.

While the phylogenesis of the thymus in the descending scale of the animal kingdom shows large gaps, in the ascending scale it has been minutely studied. But the articles on this subject discuss almost exclusively the anatomical and histological relations. The functional side is retired completely into the background. But these morphological studies have furnished thymus physiology with valuable guideposts, inasmuch as they have given us a deeper insight into the biology of this organ. We may sum up all our morphological and ontogenetic information as follows: The thymus was formerly considered an organ similar to a lymphatic gland and arising from the mesoderm. This theory was overturned by Koellicker, who was able to prove conclusively that the gland is of purely endodermic origin and is derived from the gill pocket epithelium. At an early period it is possible to trace its relations to the connective tissue. These obscure relations have been the subject of extended scientific discussion. We will pass over the conflict of opinions and simply state that according to Hammar's investigations, all the various structurally different thymus elements are to be considered of pure epithelial origin.

The thymus gland is paired. The transformation to the unpaired state is accomplished rather quickly by the disappearance of the original lumen and the shrinkage of the epithelial cells. The differentiation into the darker outside layer and the lighter interior gradually follows. In tracing the life of the thymus we can distinguish an increasing and a decreasing phase. In man the increasing phase extends to the end of the second year. At this time

the thymus gland is at the height of its development. Then the decreasing phase, the involution sets in, which has its close at the age of puberty. The organ has been transformed into the so-called retrosternal thymal fat body. It is a fact of decided importance that small remains of the original thymus tissue persist during life and on occasion may regenerate.

Thus ontogeny and morphology teach us that the thymus gland is an organ of youth. This fact is of greatest importance, and should be strongly emphasized. For we are justified in assuming that the maximum anatomical development coincides with its greatest functional activity. From this we may draw the important conclusion that it is the youthful developing organism which has need of the thymus gland. In this way, ontogeny and morphology are able to assist physiology. But not only in this respect is the fact that the thymus is an organ of the youthful organism important, but also for the experimental attack of the thymus problem, as we shall shortly see. This is the most promising method for the investigation of the organ in question and may be carried out in two ways: first, with the aid of surgery one may totally or partially remove the thymus; and second, pieces of the organ may be implanted, or organic extract injected. Both methods of investigation have been tried with the most varied species of animals. The largest space in the experimental pathology of the thymus is occupied by total excision, for it was rightly assumed that the symptoms which might thus arise would give the best insight into the normal function of the organ. We shall discuss only this method of investigation, as implantation and injection of organic extract have thus far given no uniform results.

It is not within the scope of this article to detail the great number of experimental papers; only the fundamental investigations may be cited. The first to undertake extirpation of the thymus was Restelli in 1845. He informs us that he was "very unfortunate" in his operations. Out of ninety-eight animals (sheep, dogs, and calves), ninety-two died during the operation, the remaining six in from nine to twenty-three days. Restelli made one observation of importance on the few animals which survived the first postoperative days. These animals showed an abnormal appetite, ate dog-meat, straw and corn, and developed many other peculiarities. Twelve years after Restelli's communication, there appeared in Frankfort a monograph by Friedleben: "*Die Physiologie der Thymusdrüse in Gesundheit und Krankheit*" (The Physiology

of the Thymus Gland in Health and Disease). This extensive treatise is based on observations on twenty dogs. From part of these animals the thymus gland was completely or partially removed, from others only the spleen, and from a few both thymus and spleen. The operation was performed at the earliest six days, at the latest four months after birth. Friedleben was unable to discover any physical changes. However on the twenty-second postoperative day, the long bones of one animal were found to be very rich in blood-vessels and easily bent. The marrow cavity was abnormally large, the bone layer thin. Another of Friedleben's dogs merits our especial interest: For four months after the operation this dog showed no abnormalities. Then he grew thin, developed perversity, suffered attacks of colic and died from extreme emaciation. Friedleben lost the animals from which the spleen had been removed largely through septic processes. One animal from which both spleen and thymus had been removed developed no infection; it died three months after the operation from exhaustion, although it had grown fast and shown a good appetite in the first week. Friedleben summed up the results of his investigations as follows: Thymectomy itself causes neither death nor any specific changes. The same conclusion holds for the spleen; however, the removal of both organs causes a disturbance in the formation of blood and finally death from exhaustion. To confirm his results Friedleben partially removed the thymus from three goats. Two of the animals died from accidents. The third developed in a perfectly normal manner. Ten months later it was killed. The autopsy showed nothing except that the remaining thymus fragment had assumed the weight and structure of a normal thymus. Friedleben laid no importance on this remarkable fact, which is important, however, because it proves that the thymus possesses a remarkable power of regeneration, a fact which of itself speaks strongly against the supposed unimportance of this organ. On the other hand, from the tenacity of the thymus one must conclude that it is impossible to count on a clear picture of abnormalities after partial removal of the gland. And as in all of Friedleben's experiments we have no guarantee that total extirpation was accomplished, in spite of all his system in planning and admirable execution, we can scarcely take them into consideration in establishing of the rôle of the thymus in the organism. If we examine Friedleben's work in all its details, we come to the conclusion that the main reason for his failure lay in insufficient surgical technic. If we add to this

the failure to consider evolutionary and biological facts—we mean operation at too late a period—we have the two characteristics which distinguish the larger number of experimental investigators to be described below.

We can thus sum up the results of all the work up to 1905. One group of authors regularly observed after total thymectomy, disturbances in bone and nervous system, and changes in the glands of internal secretion; another group denied every influence of the operation on the organism. The status of thymus investigation in 1905 may be expressed in the few words: Total thymectomy is an operation of no consequence to the organism, and the thymus gland is an organ unimportant to life.

The years which followed were destined to upset this view in all its details. On the basis of exact experimental work it was possible to demonstrate that the quantitative removal of the thymus at the period of maximal development gives rise to specific pathological disturbances, followed ultimately by death, and that therefore the thymus is an organ necessary to life. The researches which saved the honor, so to speak, of the thymus gland are first those of Basch, and second, in especial measure those of Klose. Since the work of these authors is almost coincident in plan with the results which we wish to consider, it will be given special attention. We will first consider the investigations of Klose, in which the writer in large measure personally took part.

In order to obtain results free from criticism, the first task was to correct the mistakes from which former investigations had failed. Accordingly the principal demand of thymus investigation was fulfilled; an operative method and technic was devised which guaranteed the quantitative removal of the thymus, while preserving all surgical precautions; and second, the operation was undertaken at the time of maximum development of the gland. The experiments were made on dogs. Each time whole litters were operated, and each series had its healthy control animal. The operation was performed between the tenth and fourteenth day after birth, since at this time the thymus of the dog is at the height of its development. The postoperative history was as follows: At first the thymectomized animals developed exactly as the control dogs. Neither weight nor growth showed any variations from the normal. Accordingly these first two to four weeks are known as the "latent period." If the dogs are observed longer, characteristic differences will soon appear between the operated and the control animals. In the thymecto-

mized animals, a marked fat layer develops; if one touches them they are found to be soft and flabby and the muscles are less firm. While the control dogs run about hours at a time, the operated animals rest every few minutes. One observes a failure of strength, a very apparent weakness. The gait becomes wide and awkward. If one attempts to bend the extremities, a pronounced elasticity is observed. The operated dog is also distinguished by an enormous appetite, eating with no difficulty a portion double that of his healthy brothers. In the selection of his food he displays some perversity. This second stage which distinguishes thymectomized dogs is called from the enormous development of the fatty layer "stadium adipositatis." In about the third to fourth month pronounced changes set in. The curve of body weight, which up to this point has steadily risen, suddenly falls. The amount of food taken, however, is enormous. The weakness of body, and especially of the bones increases. The animals become awkward in their movements and fall easily. At times they are seized by a universal trembling of the muscles. The gait becomes still more broad and labored. The bones of the extremities bend under the weight of the body, and frequent spontaneous fractures occur. This severe condition continues for months. In the most extreme cases it continues until the fourteenth month. In the last week extended physical changes occur. The animals are completely imbecile. They lie as in a comatose state, and on attempting to rise, fall at once to one side. Apparently an extended paresis is present. In spite of the taking of abundant food, the weight steadily decreases. Finally death in coma results. This last phase is known as "stadium cachecticum," "idiotia thymica," and "coma thymicum," or as "cachexia thymopriva." In animals operated in the third to fourth week of life the same symptoms appear, but they appear later and more slowly. In such animals the stadium adipositatis may last as long as six months, the stadium cachecticum to the twenty-sixth month. An operation at a later period, as we already have stated, is of no value in drawing definite conclusions. On account of their great importance, let us again briefly summarize the reasons for this: First and most important, in dogs, after the fourth week of life, the thymus has already begun to involute, and another organ, as we shall see, has begun to take its place. Further, it is a technical impossibility to remove the thymus completely at this time. And finally, the animals seldom survive the operation, as a double pneumothorax usually results—very young animals may survive, but older



ones rarely. We have stated that one of the first symptoms of thymectomy is weakness of the bones. Indeed the *changes in the bones* are the best indication of a pathological condition in the thymectomized animals. The whole skeleton, especially however the long bones, shows a failure to develop a normal length. Thus the femur of thymectomized animals measures on the average 104 millimeters, that of healthy animals 132 millimeters, the tibia 62 millimeters as against 102 millimeters in the normal. The bones are also brittle, like decayed wood. If a longitudinal section of the long bones is made, the following facts will be noted: The spongiosa show numerous large cysts such as are present in osteoporosis. At the location of the large cysts occur the spontaneous fractures mentioned in the clinical description of the operated animals. It is further noticed that the compacta are irregular, abnormally broad and not sharply bounded. In a Roentgenogram the spongiosa appear much lighter, the diaphysis thickened and broadened. For this reason the bones have a plump appearance. The cartilage of the epiphysis is not regular and is often noticeably broad, the epiphysial line is retained. In short it is a case of distinct hypoplasia of the bones. Microscopic examination reveals in addition to the osteoporosis an enlargement of the primordial marrow spaces and an increase of the cartilaginous basal substance. If the skeletal system is further investigated, changes are found which point to a variety of alterations in the bone. Thus the ribs are found to be abnormally soft and flexible. This is due to the fact that they, as also the ensiform process of the sternum, are entirely cartilaginous in character. A result of this softness and lack of rigidity is an extended malformation of the chest. In the skull, in addition to a diminished lateral growth, broad fontanella are often found. On microscopical examination of such bones of thymectomized animals, it is found that the osteoblasts are flatter and more spindle-shaped than in the control dogs, the trabeculæ are of greater fineness, the giant cells are less frequent and of smaller size. It is easily seen that the *process of ossification has been greatly interfered with.*

In judging of these changes in the bone, chemical analysis is of great value. If the bones of thymectomized and healthy animals are subjected to an exact comparative analysis, a great difference will be found in the quantity of inorganic constituents present. It is known that bone consists chiefly of calcium phosphate and carbonate. The relation of the amounts of the two calcium salts in thymectomized dogs is the same as in healthy animals, but the total

quantity of calcium of the entire skeleton of the dogs from which the thymus has been removed is only half the amount found in the control animals. Thus in 100 grams of dried healthy bone is found 65 grams of calcium salts; in 100 grams of bone from thymectomized dogs only 32 to 34 grams.

Let us now make a critical summary of the changes in bone: After total removal of the thymus in young animals a specific thymectogenic change in bony tissue occurs. Pathologically and anatomically a condition is presented which cannot be distinguished from rachitis or osteomalacia. Further, there exists an osteoporosis. On the basis of chemical analysis these changes may be referred to the lack of undissolved calcium. This condition arises either from the fact that the supply of undissolved calcium is cut off from the bone-building cells—as seen in the cartilaginous condition of the ribs—or from the fact that the undissolved precipitated calcium is changed into the soluble form, as appears from the condition of the long bones. That a distinct anomaly in calcium metabolism is actually present is shown by the following experiments. If artificial fractures are produced in thymectomized dogs, these do not heal normally by calciferous bone callus but are overgrown by connective tissue, and remain perfectly movable. The organism has lost the power of laying down calcium. Further it was possible to determine that the elimination of calcium salts is twice as great in thymectomized dogs as it is in normal animals.

We question the cause of this occurrence. The answer to the question leads us into the realm of theory. Klose reasons as follows: The precipitation of calcium salts is brought about by alkalies. As dissolving agents only acids are active. After thymectomy an overloading of the organism with acid, an acid poisoning arises. The phosphoric acid set free in the organ is chiefly responsible, for it is very probable that the thymus has the function of removing the free acid, "masking" it by combination with complex substances, mainly in nuclein synthesis. This hypothesis has been vigorously attacked in connection with a statement of Levy that from a mixture of calcium phosphate and carbonate the latter must be more rapidly dissolved by an acid than the former. Analysis of the bone of thymectomized animals shows, however, that the relation of calcium phosphate to carbonate is always the same, consequently it was urged, it was impossible to attribute the abnormal calcium metabolism of thymectomized animals to the action of an acid. Liesegang, however, was able to show that Levy's chemical deductions

held only for an aqueous medium. If the reaction is allowed to go on in a medium of gelatin, it is found that calcium phosphate and carbonate are dissolved in proportionate amounts. Such a gelatinous medium we actually have in the connective tissue of the bone. Levy's deduction thus fails to disprove Klose's theory. At present we must regard it as very plausible.

Aside from the changes in the bones of thymectomized animals, the most definite alterations occur in the nervous system. In describing the clinical history of "cachexia thymopriva," we have already mentioned "idiotia thymica." We have also spoken of the clumsy gait developed, and of the appearance of fatigue and paresis. This indicates that thymectomy gives rise to motor disturbances. Further it was demonstrated that sensitiveness to pain diminishes, that at times an analgesia sets in. The most noticeable alteration in the nervous system, however, is the changed reaction of the peripheral nerves to the electric current. Soon after the operation an increase of excitability is evident, which is apparent from the diminished values for K. O. C., 1.5 to 2.0 m.a. as against 6.5 m.a. in the normal. The values also decrease for the A. O. C., though in lesser degree. Anatomically and pathologically inflammatory changes appear. In the central nervous system a peculiar swelling and liquefaction occur. For this reason the brain is larger than in normal animals. Klose and Vogt attribute these changes to the same causes as the lack of calcium. They recall the fact that Martin Fischer showed that an abnormal accumulation of acids in a tissue led to edema and swelling, further, that in the presence of water, colloids swell up under the action of acids. They regard the swelling of the brain substance as the direct result of the universal acid poisoning. With this assumption the relations between thymus and nervous system are cleared up, and one is forced with these authors to the conclusion that the function of the thymus in binding acids is of vital importance to the nervous system.

We have seen that with the assumption of the acid binding function of the thymus it is possible to explain the important changes which occur after thymectomy. This view, which has grown out of the results of experimental investigation, makes clear to us the physiological significance and vital importance of the thymus. It would be wrong to assume, however, that this is the only function of the gland. It shows numerous other relations. We will discuss briefly the relation between thymus and blood. The formation of almost all forms of corpuscular blood elements has been ascribed

to the thymus gland. It has been called the cradle of red corpuscles, polynuclear leukocytes, and lastly lymphatic cells. We will pass over all the discussion and simply state that on the basis of an investigation of all histological material at our disposal, we are led to the conclusion that the thymus gland is to be regarded as an organ entirely devoid of any hematological function, taking no part in the formation of the blood. The thymus is an organ of internal secretion. *A priori* the possibility is granted that the specific secretion product of the thymus may exert an influence on the blood-forming organs. This point cannot of course be decided by anatomical or histological investigation, but only by experiment and clinical observation. Numerous investigations have indicated that the thymus gland is the organ which controls the lymphatic system. This influence upon the lymphatic apparatus may be either direct or indirect due to the fact that the thymus secretion is of importance for the excitability of the vagus. We see that patients having a large thymus, as in thymus hyperplasticus, Basedow's disease, and lymphadenosis, show a noticeable increase in the lymphatic cells in the blood. If the thymus is removed, a decrease in the number of leukocytes occurs. This is also observed in thymectomized animals. Before the operation a considerable lymphocytosis is always observed. By following the conditions in the blood for weeks and months after the operation, it is found that the lymphocytes gradually become less numerous and finally reach a relatively small value. The reverse is the case on implanting thymus or injecting the extract. An acute increase in the number of leukocytes results.

Finally we have only to consider the relations between the thymus and the other organs of internal secretion. We can record only a few facts: It has been found that after thymectomy the pancreas, the thyroid, the sexual glands, and the spleen become hypertrophic. Especially clear is the interrelation of thymus and sexual glands. These organs after thymectomy assume double or even three times the weight of the corresponding organ of healthy dogs. On the other hand, in cases of human thymus patients, a remarkable smallness of the sexual glands is found. It is an old observation, that castrated subjects always have a large thymus. From this we are justified in drawing the conclusion that an antagonism exists between thymus and sexual glands.

Last of all the spleen requires special notice. For according to all appearances it is the organ which acts vicariously as a substitute for the thymus. One is led to this conclusion from an anatomical

and histological consideration of the spleen after extirpation of the thymus, and from the following fact: If the thymus residue of dogs is extirpated from the fourth to the sixth week after birth—a time at which the organ has already begun to involute—the only result is the appearance of rachitis-like disturbances of growth for about three months. After this time the dogs recover. Some organ must have assumed the function of the thymus, and as above stated, this organ is in all probability the spleen. For if the spleen is removed from animals thymectomized at this late period, death results in a few weeks with the appearance of severe cachexia. Thus we have a precipitation of the symptoms which develop after extirpation of the thymus at the time of its maximal development.

We have seen that the functions of the thymus are varied, that numerous complicated relations exist between it and other vital organs. We again summarize: The thymus gland is an organ of vital importance. Extirpation at the height of its development results finally in death. Most probably its most important function consists in binding acids, thus removing injurious substances from the blood. This supposed function gives us an explanation of the disturbances occurring in the calcium metabolism after extirpation of the organ, for the changes in bone and in the central nervous system. The thymus gland occupies a dominating position over the lymphatic apparatus. Between the thymus on the one hand and the organs of internal secretion on the other, complex relations exist. This is especially true of the spleen. This organ is, so to speak, “prepared” by the thymus to take up some of the latter organ’s still unexplained functions after involution.

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## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON PEDIATRICS.

*Stated Meeting, held February 13, 1913.*

DR. HENRY DWIGHT CHAPIN, *in the Chair.*

#### A CASE OF POLYMYOSITIS WITH MULTIPLE LIME DEPOSITS IN A BOY OF FIVE YEARS.

DR. SARA WELT KAKELS presented this patient. The boy was five years of age. His family history revealed neither lues nor any hereditary nervous disposition; no one in the family had suffered

from a disease similar to that of the boy. The parents had been married eight years and had one other child, three and one-half years of age, who was well. The patient was born at full term and the delivery was spontaneous. He had had ophthalmia neonatorum from which he recovered after a few weeks. He was breast fed until he was eight months of age and developed normally until the present illness began in April, 1911. At that time he became indisposed, lost his appetite and had difficulty in walking; he could not climb stairs or move his legs. He walked on his toes. About three weeks after the onset of the prodromes an exanthema appeared which was taken to be scarlatina and which lasted about eight days. Then painful swellings appeared in the legs up to the knees, mainly over the calves and later the arms became involved, especially the left one. The face also became edematous and reddened mainly in the palpebral region, so that the child could scarcely open his eyes. Soon he could not move his extremities nor raise his head. Both active and passive motion caused severe pain, especially in the joints and back. The sensorium remained free during his entire sickness which rendered him entirely helpless for two weeks and confined him to bed for two months. The eruption was followed by a distinct desquamation; there was no exudate on the tonsils and the urine was free from albumin. As the boy did not improve various physicians were consulted and among the diagnoses made were encephalitis and spastic paralysis, muscular dystrophy, poliomyelitis anterior, acute articular rheumatism, toxic arthritis and spondylitis. One orthopedist advised tenotomy of both tendines Achilles, as both feet were in the pes equinus position. Another diagnosed left-sided coxitis and put the limb in plaster cast, which was removed by the father, as it caused considerable suffering. Further medical services were refused and the services of a masseur secured. After about thirty treatments the boy began to improve and the swelling of the extremities slowly receded. The swelling and redness of the eyelids persisted. During this period the boy suffered repeatedly from an itching eruption like urticaria. Toward the end of 1911 the boy had a slight attack of measles; January, 1912, he again complained of pain and the former condition recurred. In September, 1912, he was brought to the children's department of Mount Sinai Hospital.

His present condition shows a boy rather poorly nourished and with a rectal temperature always slightly elevated. He is of good intellect and rather bright. The face appears bloated and tense; there is slight edema of the cheeks and eyelids; sometimes he can scarcely open his eyes. The pupils are equal and react to light; the fundi are normal. The buccal and pharyngeal mucosa was reddened. The anterior and posterior cervical glands were considerably enlarged; the axillary, cubital and inguinal glands were slightly enlarged. The viscera of the thorax and abdomen were normal; the spleen was somewhat enlarged, its anterior margin being palpable. There was an urticaria-like eruption on the skin of the trunk and lower extremities which itched somewhat. Similar



eruptions repeatedly appeared and after short duration disappeared. The skeletal muscles were thin and flabby, especially on the left arm. There was motion in all joints excepting those of the hands, mainly the left one. The motion of the ankle-joint was slightly limited. The superficial and deep reflexes were normal; tendon reflexes of both upper extremities were slightly diminished. There were no facial phenomena. Electrical irritability and the sphincters were normal. The appearance of the left hand was very striking, being considerably swollen, painful on pressure, edematous and purplish in color. There was no pitting. The infiltration extended beyond the phalanx of the middle finger. A similar but less marked condition involved the right hand. In the right gluteal region three indurations the size of a barleycorn could be felt. They were not painful on pressure. In the left gluteal region was an induration somewhat larger and flatter but not painful.

Von Pirquet and Wassermann tests were negative. Microscopic and chemical examination of an excised piece of indurated skin showed deposit of lime in the subcutaneous tissue.

#### TRANSFUSION FOR PERSISTENT HEMORRHAGE FOLLOWING SEPSIS.

DR. A. L. SORESI presented a child whom he had transfused last November. Pus was running out of both ears, the fingers and eyelids were also purulent. The gums were soft and bleeding. The child was found to be suffering from empyema. General anesthetics could not be administered on account of the poor condition of the patient and a persistent cough, the result of the empyema and previous pertussis. An incision was made under local anesthesia, cocaine 1 to 500. Pus was evacuated from the left pleural cavity. Wound was still bleeding after forty-eight hours. Bleeding from the gums had increased and the child was in desperate condition. Hemoglobin had gone down to 25 per cent. Transfusion was advised and accepted. A maternal cousin was the donor. Transfusion was performed, using the external jugular vein, as shown by the little scar in the neck of the patient, and was stopped after six minutes, when hemoglobin had reached 70 per cent. The child began to improve, bleeding stopped, and final recovery followed. It is the author's impression that the child's life has been saved by the prompt employment of direct transfusion.

#### REMARKS ON THE ETIOLOGY AND PATHOLOGY OF HEMORRHAGIC DISEASE IN THE NEW-BORN.

DR. OSCAR M. SCHLOSS presented this paper. He said that when one considered the comparative frequency of hemorrhage in newborn and the number of years that these cases had been recognized, it seemed rather disappointing that so little was known as to their actual cause. Among the earlier writers hemophilia was considered a frequent cause of hemorrhage in the new-born but further study has shown that most cases had no relation to true hemophilia. There was a small group of cases, however, in which this factor

unquestionably played an important part. These were the cases in which there was a distinct family history and in which if recovery occurred the patient remained a bleeder during his entire life. There was no doubt but that many cases of hemorrhage in the new-born were due to bacterial infection. Both clinical evidence and post-mortem investigation supported this view. There had been a number of epidemics in institutions where there was apparently a direct relation between the number of cases of puerperal infection and of hemorrhage in the new-born. Finkelstein divided the cases of hemorrhage in the new-born due to bacterial infection into two groups. In the first, the pyogenic organisms were considered the causative agent. In some of these cases there was definite evidence of pus formation either in connection with localized suppuration while in others the pyogenic organism, whether alone or in connection with saprophytes such as *Bacillus pyocyaneus* or some member of the protean group, was the supposed cause of the hemorrhage.

In the second group of cases special hemorrhage producing organisms were considered the causative agent. Such organisms had been described by Babes, v. Dungern, Gartner, Lubarsch, and others. In most instances these organisms caused hemorrhagic forms of septicemia in animals. The results of bacteriological studies had been very inconstant and a great number of different organisms had been isolated from the bodies of infants who had hemorrhage during life. The fact that the organisms were for the most part obtained on postmortem examination suggested that in some cases at least their presence was due to postmortem invasion. Evidence seemed to indicate that syphilis was an important factor in the etiology of hemorrhage in the new-born, caused definite vascular changes and was frequently associated with hemorrhage and that in many cases it was the only determinable factor. In addition to the general diseases there were certain local causes of hemorrhage in the new-born, such as gastric or duodenal ulcers. It had also been suggested by some writers that cases of hemorrhage in the new-born were due to some form of intoxication, especially to chloroform poisoning. Investigators have differed on this subject and the final solution of the question must depend upon further study and experiment. It seemed only rational to believe that the ultimate cause of the bleeding was some pathological condition of the blood-vessels. The blood had been examined in very few cases and the results from these examinations had been by no means constant. In one group of cases the blood coagulation was greatly delayed or absent. In two such cases in which the blood was examined by Dr. Commiskey and myself there was a great diminution or absence of thrombin. The same condition of the blood was found by Whipple in a fatal case of hemorrhage in a new-born infant. In another case which Dr. Schloss had investigated blood coagulation was delayed but the striking feature was the softness of the clot. In this case there was a deficiency of fibrinogen. In a second group of cases the blood coagulated within the normal time but the clotting was incomplete.

In a third group of cases the coagulation took place within the normal time limit and was apparently complete. In these cases the hemorrhage was probably due to some vascular lesion localized in the areas from which the bleeding occurred. In discussing this subject one is confronted by the fact that there are a number of phases of normal blood coagulation which are imperfectly understood. Reduced to its simplest terms, blood coagulation was the action of thrombin or fibrin ferment on fibrinogen in the presence of calcium salts to form fibrin. Fibrinogen circulated in the blood as such. It was unnecessary to discuss the activation of prothrombin into thrombin but Morowitz and others assumed that this involved an activating substance or kinase. Hamell, on the contrary, maintained that thrombin was not a chemical substance and that the function of kinase was not to activate prothrombin but to neutralize antithrombin. Without going into this discussion it might be stated that pathological hemorrhage might be due to deficiency, absence, or interference with the action of any of the substance entering into blood coagulation.

It was very desirable that tuba vitam blood cultures should be made in these cases of hemorrhage in the new-born for it was only by this means that the true rôle of bacterial infection could be determined. The absence of clinical evidence of septic infection was not of sufficient value to exclude a bacterial cause as was illustrated by two cases observed by Dr. Commiskey. In the first of these cases the infant began to bleed from the navel the day after birth; the hemorrhage continued and death ensued on the third day. The temperature was never above normal but was subnormal most of the time, nor was there any physical evidence of sepsis. Post-mortem examination showed a hemorrhagic endocarditis and myocardial and intestinal hemorrhages. The second infant began to bleed from the cord on the fourth day. The hemorrhage continued and the child died on the following day. The fatal outcome in this case was not due to the loss of blood. Autopsy showed hemorrhagic endocarditis and congenital syphilis, and a capsulated diplococcus was cultivated from the heart's blood. At no time did the infant have fever or any sign of sepsis.

Our recent knowledge of the etiology of hemorrhage in the new-born might be summarized as follows:

Some cases of bleeding in the new-born are due to hemophilia.

Some cases of hemorrhage in the new-born are due to bacterial infection, often in connection with septicemia or pyemia. Other cases are due apparently to congenital syphilis.

Cases had been reported in which melena was due to gastric or duodenal ulcers, the etiology of which was not definitely known.

The rôle of chloroform intoxication as a cause of hemorrhage in the new-born was at present doubtful.

There remained a group of cases in which none of these pathological conditions were evident. In the absence of any adequate explanation at present it seemed proper to regard these cases as due to some defect of blood coagulation or to a vascular lesion.

There was no constant pathological condition of the blood in hemorrhage in the new-born.

The fact that these hemorrhages were due apparently to different pathological conditions and that the investigation of the blood failed to show the presence of any uniform change forced the conclusion that the hemorrhage was merely a symptom to which there existed a predisposition during the first ten days of life. On the other hand, if there was a uniform pathological condition common to all cases, this condition was at present unknown.

#### HEMORRHAGIC DISEASES IN CHILDREN. ÉTIOLOGY, PATHOLOGY AND TREATMENT.

DR. A. L. SORESI read this paper. He stated that all the hemorrhagic diseases known as purpura, hemorrhagic diseases of the new-born, hemophilia, scorbutus, etc., should be grouped together under the name of hemorrhagic diathesis, because their pathology and etiology is little known and they seem to be merely symptoms of different pathological conditions, rather than distinct pathological entities.

Are the causes underlying these conditions to be found in the blood, in the blood-vessels or in both? It seems reasonable to think that what appears in the blood and in the blood-vessels is not primary but the result of faulty general metabolism. In normal individuals the blood flows freely from the arteries into the veins through the capillaries, and whenever bleeding occurs, there is an immediate tendency of the blood to coagulate. In hemorrhagic diathesis the blood oozes out of the capillaries for causes which in normal individuals would not cause any trouble; this fact is what makes the condition a pathological one, because also in normal persons the blood oozes out of the tissues when they are cut, or traumatized, or the atmospheric pressure is increased or lowered beyond certain limits. Besides the hemorrhage, which could be called spontaneous, the blood does not coagulate immediately as in normal conditions, or does not coagulate at all. And this distinguishes hemorrhagic conditions from hemorrhage, where the blood has a more marked tendency to coagulate, the more severe the hemorrhage is.

Of all the agents which are thought to be the cause of hemorrhagic diseases, such as syphilis, rickets, anemia, infectious diseases, faulty intestinal and hepatic function, improper food, etc., it can be said, that each one can be the known cause in single cases, but none of them individually or all together can explain the majority of cases of hemorrhagic disease.

The theory that hemorrhagic diseases depend on an abnormality of the capillaries has a certain anatomical basis, although there is no evidence to prove it. It could be, that the capillaries have lost their tonicity, so that they cannot stand the pressure under which the blood is flowing and their fine mesh lets the blood escape through. This first phase of the hemorrhagic manifestations should not be confused with the second phase, the late or wanting coagulability

of the blood, which could be attributed to the fact that the blood contains certain principles which retard or prevent coagulation, or certain of its constituent are not present or are present in too great amount. In certain cases the cause of lack of coagulation is traced to well-known factors, in the majority this cannot be done.

Whichever are the elements which prevent or retard coagulation, it is evident that they are the result of a faulty metabolism. The fact that hemorrhagic diseases are more prevalent in children than in adults, seems to show that the different organs of the body have not yet reached a harmonious collaboration between themselves, and the pathology of these diseases will be more clear if they are studied together with some conditions disturbing the general metabolism of adults, such as pernicious anemia, diseases of the liver, infectious diseases, chloroform poisoning, etc., in which there is also a tendency to spontaneous hemorrhage and lack of coagulability of the blood.

Postmortem findings show only a lack of coagulability of the blood.

The diagnosis in these cases is generally easy.

Prophylaxis can do some good in hemophilia and scorbutus.

Salts of calcium, stiptics, gelatin have been found of very limited benefit.

In scorbutus and purpura change of diet and fruit juices have been found very valuable.

The best and really only effectual treatment has been what can be called the physiological treatment. That is, as long as the normal blood contains active principles, which help to maintain the tonicity of the blood-vessels and favors coagulation, these principles lacking in the system of the patient suffering from hemorrhagic diseases, have been supplied by injecting or transfusing directly blood serum or full blood.

This physiological treatment must be considered under two different views. One is, when the patient is seen early and the only indication is to stop bleeding; the other is when bleeding is very persistent and the patient has lost a great amount of blood. In the first case horse serum, and when available human serum, should be employed as soon as possible. In the second case direct transfusion should be resorted to. The injection of serum introduces into the system thrombin, which will establish the normal balance of anti-thrombin and thrombin or prothrombin, so that, the circulating blood will be able to react normally. In some cases of hemophilia further bleeding has been stopped by applying a piece of gauze soaked with blood obtained from another person. In cases where bleeding has been very severe, and children stand very poorly severe hemorrhage, life is in danger from two causes, the persistent bleeding, and the dilution of the blood which makes it unable to carry on the work demanded by the general metabolism. It is evident that the injection of serum can only stop further bleeding, but cannot supply the morphological elements of the blood lost through hemorrhage. As we do not know which are the elements favoring coagulation, but all these elements are present in normal blood, it is logical to conclude that the introduction of full normal blood in the patient's system is



the most rational treatment. Only one consideration could favor the use of serum or defibrinated blood; that is if in extracting the serum or defibrinating the blood it could be proved that new elements favoring coagulation were formed or the ones exciting it in the blood made more active. The strongest argument in favor of direct transfusion is that many cases have been benefited and cured by its use, which had received previously all other treatments, while no case where transfusion had failed has been cured by other means.

Basing this assertion on thirty-one cases of hemorrhagic diseases of the new-born, of which twenty-eight were cured and three died; on twenty-three cases of hemophilia of which twenty-one were cured and two died; of six cases of scorbutus of which three were cured and three died; of nine cases of purpura of which eight died and only one was cured, it can be said that in direct transfusion of blood when properly performed surgeons have a specific remedy for hemorrhagic diseases, except purpura.

While everyone understands that direct transfusion would be the ideal treatment; the idea that it is of difficult execution has prevented it from becoming more generally applied. There are certain rules which can make direct transfusion successful in practically every case. It should not be resorted to too late, when the patient is practically dead; its technic must be perfect. Faulty technic is the cause of many failures. In doing direct transfusion the blood of the donor has a great tendency to coagulate. To avoid this accident the greatest care must be taken not to injure the intima of the blood-vessels. To accomplish this the author's instrument is presented. It is composed of two little tubes, crowned at one end with four hooks, put and held together by a little bar and a screw. The blood-vessels are carefully isolated, one of the tubes is passed under the blood-vessel of the recipient and cuffed over the hooks; the same thing is done with the blood-vessel of the donor. Both blood-vessels are cut close to the edge of the cannula, and put together by inserting the bar of one-half of the instrument in the corresponding hole of the other. The blood will flow freely from the donor to the recipient as from one continuous blood-vessel. The next important point is the selection of the blood-vessels to be anastomosed. For the recipient the best is the external jugular vein, as it is very accessible and always of good size even in infants; the scar on the neck is scarcely visible after a few months. By using the external jugular the blood flows directly into the heart giving immediate relief. For the donor a vein of the forearm is to be selected, as there is absolutely no reason to sacrifice the radial artery, as it has been done formerly. The blood will flow freely because the pressure in the veins of the arm is about  $+10$  Mm. Hg, while in the external jugular of the recipient the pressure is negative and the flowing of the blood will be helped by the diastole and the movements of inspiration and expiration. Many failures are also due to the fact that surgeons are not master of their technic; therefore, no one should attempt transfusion who has not mastered its technic on living animals.



## THE TREATMENT OF HEMORRHAGIC CONDITIONS BY THE INJECTION OF HUMAN SERUM.

DR. ROGER HERBERT DENNETT said he regretted that Dr. John Edgar Welch could not be present to read his paper but that he would mention briefly the results they had obtained from the use of the human blood serum.

The first case he saw with Dr. Welch was a child who had had a hidden meningeal hemorrhage; the child was in an extremely bad shape and was practically moribund. He was six days old and the symptoms of hemorrhage had been going on since the third day of life. Inside of six or eight hours after the injection of the human blood serum, the entire condition changed, just as has been described following a transfusion. Shortly after the second injection the child began to nurse again. Lumbar puncture had been done upon the first day to confirm the diagnosis of hemorrhage, and pure blood withdrawn from the spinal canal. On the day following the first injection of serum, another lumbar puncture showed that no further hemorrhage was taking place. Dr. Dennett said that he wished to mention this case particularly because he had heard it said that desperate cases of hemorrhage should be transfused. This was an instance where an extremely desperate case was cured by an injection of the human blood serum. Dr. Soresi had mentioned that there were two great advantages in transfusion, one, cessation of the bleeding, and the other, the formation of new blood. Even if it were claimed that all the serum did was to stop the hemorrhage, it was remarkable how quickly infants seemed to be able to add to their blood supply.

Dr. Welch had called especial attention to the use of the serum after the hemorrhage had ceased. The more they used the serum the more were they in favor of continuing its use for at least four or five days after the cessation of the hemorrhage.

He said he wished to cite a case in which the outcome was less fortunate than the one reported above. This case he saw in consultation. There was a visible hemorrhage which was apparently uncontrollable; the serum was employed and after two days they believed the hemorrhage had ceased and the use of the serum was discontinued. On the fourth day, however, there was a recurrence of the hemorrhage which was very severe and the child died as a consequence. Had they followed the rule above given, continuing the use of the human blood serum long enough after the hemorrhage had ceased, the child might have been saved.

Of course, neither the use of the human blood serum nor transfusion will cure syphilis or septic infections, nor could they expect to cure or heal any ulcers of the gastrointestinal tract. They could not expect the human blood serum or transfusion to act as a panacea for all hemorrhagic conditions occurring in the new-born. Until these conditions were better classified than they were at the present time they must use the human blood serum or transfusion in all the cases that came along.

Dr. Dennett said Dr. Soresi was so very proficient in his transfusion work that he could not help but believe that the rest of them did not have the opportunity of doing this work so beautifully as he. He was sure that the technic was not so easy as Dr. Soresi had led them to believe, although it was probably quite easy for him as he was so familiar with the procedure.

#### MORBID HEMORRHAGIC CONDITIONS IN CHILDREN.

DR. LEO JOHN JOSEPH COMMISKEY read this paper. He recalled that whole blood was first used as a means of treatment of hemorrhage in the new-born by Dr. Schloss in April, 1908, and that since that time twenty-one such cases and two cases of hemorrhage in older children had been treated by this method. Of these twenty-one cases fifteen recovered and six died. Of the two cases of hemorrhage in older children, one a case of bleeding following the extraction of a tooth and the other in a child suffering from erythema nodosum who developed a purpura hemorrhagica and bled from the mucosa of the mouth, both recovered. These statistics included all cases and all types of bleeding and comprised among the fatal cases those which were practically moribund at the time treatment was instituted and several infants that died not on account of hemorrhage but because of an underlying septic factor. One infant had been bleeding for eight days when admitted to the hospital and died three and one-half hours later, having received only a single injection of 10 cubic centimeters of blood. Such cases could with propriety be excluded from their statistics but an accurate estimate of the therapeutic value of any measure could only be made by the results from all cases. The blood was usually taken from the vein of the forearm by means of an exploratory syringe and was injected immediately into the subcutaneous tissues of the infant's back before the blood had had time to clot. The blood was usually obtained from one of the parents or relatives. The advantages of whole blood were that it could be easily and readily obtained, could be used immediately, and required no complicated apparatus.

Since hemorrhage in the new-born was due to different pathological conditions it seemed an advantage to inject the unchanged blood which contained all the elements essential for coagulation. The objection to whole blood on the hypothesis that the cells must be broken up and excreted and, in consequence, put an extra strain upon the organism, in practical experience was of no real importance. The blood was quickly absorbed, usually in from two to four hours and for some reason did not coagulate in the tissues. In no instance had there been any harmful influence. Injections of whole blood had been given to feeble premature infants with a decidedly beneficial effect. Injections had been given to a number of extremely marantic infants; the pulse, temperature, respiration, and weight were carefully watched and the urine examined and in no instance was there any deviation from the previous condition.

On the surface the statistical results obtained by this method

were not striking, but they included fatal cases in which the method had not been given a fair trial. In a number of cases which recovered the hemorrhage was of very severe type and the results after the use of the whole blood were most convincing.

There were certain cases of hemorrhage in the new-born in which it seemed scarcely conceivable that any ordinary therapeutic measure could promise much hope. It seemed improbable that the injection of blood or serum or even transfusion could influence the cases of generalized bacterial infection. There was also a type of cases with profuse and rapidly fatal hemorrhage in which no treatment except immediate transfusion could offer any hope of success.

#### TREATMENT OF HEMORRHAGIC CONDITIONS BY DIRECT BLOOD TRANSFUSION.

DR. HENRY H. M. LYLE said that in all pathological hemorrhages the simpler method of serum and whole blood injections should be tried before resorting to transfusion; in severe acute hemorrhages saline infusions or blood transfusions were indicated.

If the value of a procedure were measured by its simplicity, then the technic of transfusion was not ideal; direct vessel suture required special training and skill; the cannula method of blood-vessel anastomosis had placed in our hands a much simpler means of transfusion. The cannulae of Payr, Crile, Elsberg, and Soresi, were modifications of Quierolo's glass-tube method. Dr. Lyle's experience had been limited to those of Crile and Elsberg. The latter had given great satisfaction. The use of fine paraffined gold tubes as described by Carrell was undoubtedly the simplest method. If clinical experience substantiates the promise of this procedure they would have a technic that can be performed by any physician, and that is what we need.

Dr. Lyle said it was now a well-established fact that severe acute cerebral anemia, though lasting only a short time, might do irreparable damage to the central nervous system. To prevent such a disaster prompt action was required; the ordinary transfusion was not practicable under such circumstances. These patients could be resuscitated to the extent that they would perform their automatic functions, that they breathed and the heart beat, but the central nervous system never recovered from the cell destruction caused by the anemia, and after a longer or shorter period the automaton died, or should he recover it was with a permanently damaged central nervous system. Although rare this occurred most frequently in operations on small children. Ordinary transfusion would not be applicable in such cases. A simple method of direct blood transfusion might avert such a disaster, could blood be withdrawn from a nearby donor and injected directly into the jugular vein of the infant.

In Bier's method of blood injections for ununited fractures, 20 to 30 c.c. of blood were withdrawn from the patient's vein and injected between the bones. The medium to prevent clotting was

warm sterile salt solution. The objection to this method was the rapidity with which the blood clotted. In order to overcome this difficulty Dr. Lyle drew warm sterile liquid albolene through the needle into a Record syringe, and then expressed the contents so that only a very fine film of albolene remained. In this manner 30 to 60 c.c. of fluid blood could be withdrawn and kept in the syringe for a considerable time. It might be possible to use this technic as an emergency transfusion.

Dr. Lyle believed that a similar method of paraffined double needles had been used, or its use suggested, in the children's service at Bellevue. What Dr. Soresi had stated regarding his method Dr. Lyle said was an excellent suggestion and one which he said he would try in the future.

Dr. Lyle presented photomicrographs of the blood of a patient who had been transfused for pernicious anemia. Fifty per cent. of the leukocytes of the recipient, contained red blood cells of the donor. Technically the transfusion was perfect, clinically it was a failure, the patient dying twenty-four hours later. All the biological blood tests were carried out prior to the transfusion, yet they gave no indication of what followed. Dr Lyle presented this as a note of warning in the treatment of pernicious anemia by transfusion.

#### DISCUSSION.

DR. GEORGE DOW SCOTT asked why they did not use the horse serum in hemorrhagic conditions occurring in the young, serum being obtained from a young animal.

DR. ALFRED F. HESS had seen a number of these cases, but doubted whether blood cultures would in all cases give a proper estimate of the condition. The question arose, did bacteria enter the blood current after severe hemorrhage or loss of blood? In animals it has been shown that following severe bleedings, bacteria might enter the blood current. It was also possible that this might take place under similar conditions in human beings. It was not meant to state that in the cases which Dr. Schloss reported the condition was not due to bacterial infection, but that merely routine blood cultures on these cases might give a false idea of the etiology of the condition.

Dr. Hess recalled a case of syphilis that he had seen with marked bleeding from the nose. In this case transfusion was unsuccessful, although it caused an increase in the red cell count and the hemoglobin. The oozing continued and the child died; an autopsy was obtained, but was absolutely negative.

Recently he met with a similar case of syphilis in which transfusion was not performed, but horse serum injections used. Both these cases had a positive Wassermann reaction.

In view of these cases and the frequency of syphilis, Dr. Hess believed that this disease played a very important rôle in this condition, and that in those cases in which it is the etiological factor, the injection of serum or transfusion of blood did not promise the same good results which they did in some other conditions characterized by severe bleeding.

DR. HERMAN B. SHEFFIELD asked Dr. Soresi if transfusion was considered by him to be of value in cases of persistent hemorrhage following circumcision.

DR. J. MILTON MABBOTT asked whether at maternity hospitals at the present time the blood naturally lost by a woman in the third stage of labor was ever used in the treatment of children suffering from hemorrhagic disease, referring of course to children of other mothers. In other words, was such blood which usually went to waste utilized to furnish the serum for these cases?

DR. OSCAR M. SCHLOSS, in answer to what Dr. Hess said about his second case, replied that the point made was one they should always have in mind in taking blood cultures from autopsy material. This case, however, was an antemortem invasion. There were distinct endocardial vegetations and as all knew they were of bacterial origin. Again an organism had been obtained which was capable of reproducing the condition.

DR. L. E. LA FETRA had asked him to mention two cases that he had had in his service at Bellevue Hospital and which he was unable to report in person.

CASE I.—This was an infant one and a half days old, that bled from the intestines and also vomited small quantities of blood. When brought to the hospital the infant was cold, greatly prostrated, with a rapid pulse which was barely palpable. The respirations were rapid and the infant did not respond at all when examined. There was oozing of dark blood from the anus and this blood did not coagulate. Thirty cubic centimeters of whole blood from a normal adult (not of the family) were administered. The next day the infant was jaundiced but there appeared no free blood in the stools and no blood was vomited. The stools were slightly tarry. Forty cubic centimeters of placental blood serum were then given and three weeks later 20 c.c. of the mother blood were given. From that time no more blood appeared and the infant made a good recovery. The interest in this case pertained to the stools. Immediately after 30 c.c. of whole blood were given there was an improvement.

CASE II.—This patient was a boy, seven years old, with purpura hemorrhagica, blood appearing not only in the skin but from the intestines as well. Human blood serum injections were given but with only slight improvement. Arm to arm transfusion was done and the patient was apparently cured temporarily. In a few weeks the bleeding returned and the patient was then treated by injections of whole blood in large quantities. The child improved, and the hemorrhages disappeared. After that there was another recurrence of the bleeding and this was treated in a similar manner and the condition again cleared up; there has been no recurrence.

DR. A. L. SORESI said that he did not want to be understood as objecting to the use of serum in these hemorrhagic conditions, he only wanted to point out its limitations and inconveniences. The fact, for instance, that its use must be continued for days and that



at times as much as 500 c.c. of serum have been injected, showed that it was inferior to direct transfusion which was done only once, and that the amount of blood from which the 500 c.c. of serum were extracted being at least 800 c.c. this amount was greatly in excess of that used in direct transfusion, where at times only a few cubic centimeters of blood is necessary in infants.

The injection of full blood was by no means a new procedure having been employed by surgeons before the aseptic era, who invented very ingenious apparatus for that purpose. It was completely abandoned, because the elements of the blood are very liable to be injured, and when injected, as said by Dr. Commiskey, had to be absorbed. This meant that, having been injured, they could not take up the work of general metabolism and must be eliminated, while when directly transfused, the blood was intended to have its elements continue in the system of the recipient the function they were fulfilling in the system of the donor.

In the February 8, 1913, *Journal of the Am. Med. Ass.*, Drs. Cooley and Vaughan reported a case of hemorrhagic disease of the new-born in which the median cubital vein was used and transfusion could not be accomplished, so they injected very successfully blood with a hypodermic syringe and therefore thought this method simpler than transfusion. This case was mentioned because the authors had very kind words for the technic which the speaker recommended of using the external jugular. This case was reported to show another failure in using the veins of a limb.

Drs. Cooley and Vaughan, as many speakers to-night insisted on the special skill necessary to perform transfusion, and did not seem to believe that transfusion was a very easy procedure, especially with the instrument just described and by using the external jugular vein for the recipient. At the recent meeting of the Surgeons of North America I had the good fortune to show to several hundred surgeons in my laboratory how easy the procedure was and a few of them performed the operation with as great facility as myself.

About the little gold tubes invented by Tuffier of Paris, it might be mentioned that Tuffier himself advises to have ready some other cannula, as the blood was liable to clot in the passage through his tube, and he went so far as to give the description and the picture of the Elsberg cannula. The technic lately recommended by Carrel at the last meeting of the Congress of the Surgeon of North America, which was to use the radial artery of the donor and a vein of the leg of the recipient, deserved special mention as coming from such a great authority. It was not to be recommended in every case, but only when the external jugular is not available, and he had employed himself very satisfactorily a vein of the left leg in a case on whom he had performed a transfusion for a patient of Dr. Bainbridge at the Skin and Cancer Hospital about two years ago. But to recommend its use in every case would be the gravest mistake and in some cases amounted to a practice that would almost be criminal, although not done on purpose. Indeed in cases where shock was present trans-



fusion would not only not help the patient, but certainly lessened greatly his chances of recovery, for the simple reason that in shock the blood accumulated in the abdominal vessels leaving the superficial blood-vessels, the heart, and brain almost bloodless. What one had to do in these cases was to supply the heart with the new blood, so that it could put in circulation again the blood which was accumulated in the abdominal vessels. By transfusing the blood through a vein of the leg, at the very best, we will only increase the already abnormal congestion of the abdominal vessels, therefore making worse the condition of the patient, whom we meant to help. It is only necessary to mention that the veins of the leg could not be used in infants or children because of their small size. Although not related with the subject of the paper, it might be mentioned that transfusion of blood should not be resorted to in cases of pernicious anemia, as the disease was a manifestation of faulty metabolism causing destruction of the elements of the blood; the blood transfused underwent the same changes as the blood of the patient. It would be the same as if a farmer, having a barrel of wine which turned sour on account of the barrel being in bad condition, should try to improve the sour wine by putting in the barrel good wine; the good wine would also turn sour. Direct transfusion in pernicious anemia must be limited to cases in which a new lease of life is deemed necessary for some important reasons. With regard to the use of large quantities of horse serum, the inconveniences reported were that the serum caused hemolysis of the elements of the blood of the patient, serum sickness, therefore, it has been completely abandoned in favor of human serum.

About persistent bleeding in cases of circumcision the speaker could only recollect one case reported by a surgeon, he thought from San Francisco, in which the hemorrhage could not be stopped with compression, injection of serum, or other means, and transfusion was resorted to on account of the great loss of blood. Bleeding stopped a short time after transfusion.

About the danger of a too rapid flow of blood when using the external jugular vein, if the blood was flowing too rapidly it was only necessary to make a gentle compression on the blood-vessel of the donor, to regulate the flow as desired.

DR. ROGER HERBERT DENNETT said that if one used a large amount of horse or other animal serum, he was likely to bring on "serum sickness," a condition which should be avoided. There were many instances of hemorrhages occurring in the new-born, as well as hemorrhages following circumcision, which could be helped by the use of the human blood serum as well as by transfusion.

The "whole blood" method he had adopted in the last two cases he had seen. Both children were in bad shape. It took about three or four hours for the blood to coagulate and the serum to separate. Therefore, after collecting the blood in a flask to be set aside for the separation of the serum, he attached a syringe to the needle which still remained in the vein of the donor and removed 10 cubic centimeters of blood itself. This he immediately injected

subcutaneously into the baby in order to save time while waiting for the blood to coagulate in the flask. He did not believe, however, that the use of the serum offered any advantages over the use of the blood itself. If the whole blood were used for each injection, it would be necessary to tap the vein of the donor for each dose. On the other hand, by collecting four or five ounces of the blood at a time, enough serum could be obtained to last for twenty-four to forty-eight hours. For that reason he chose the whole blood for the first injection, to be followed by the use of the serum.

DR. LYLE could not entirely agree with Dr. Soresi's conclusions of the uselessness of Dr. Carrell's advice. In operative work one was often face to face with conditions that would necessitate the use of a vein of the leg, in fact Dr. Lyle has just recently had such a case. Another point that must be taken into serious consideration was the liability of a weak anemic heart to acute dilatation; it would seem that if the transfusion were made into the external jugular, there would be slightly greater risk of acute dilatation, and that this dilatation would appear more rapidly. A sharp lookout should be kept for this complication and if it happens prompt mechanical treatment must be instituted. This is not a theoretical consideration, it had occurred.

In conclusion, judiciously employed transfusion was valuable, injudiciously employed it would become discredited.

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## REVIEW.

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HYGIENE OF THE NURSERY. By LOUIS STARR, M. D., LL. D.  
Eighth edition. Small octavo, with 133 pages and 26 illustrations.  
Philadelphia: P. Blakiston's Son & Company, 1012 Walnut  
Street, 1913. Price, \$1.00.

This admirable little classic includes in its pages simple instructions concerning the general regimen and feeding of infants and children and the nursery management of the ordinary emergencies of early life. It is a safe book to put into the hands of any ordinarily intelligent mother. Its author holds that while every woman of ordinary brain power can do much to keep her baby well she should recognize that years of experience and training are necessary to properly interpret symptoms and to handle efficiently the tools of medicine. Therefore little reference has been made to drugs or methods of medical treatment. The first chapter is written with the object of showing to the mother when, by deviations from the features of health, she should expect disease and should call in professional counsel; the subsequent chapters give information upon questions that often arise in the nursery.

## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN.

**Skin Reaction in Diphtheria and Typhus.**—Felix v. Szontagh (*Arch. f. Kinderheil.*, vol. lviii, No. 4-6) gives the results he obtained in experimental vaccination of children with diphtheria and typhus toxins, applied to scarifications of the skin. He also made control inoculations with albumin, and cow's milk, with negative results. He vaccinated with diphtheria toxin 448 children suffering from all sorts of diseases. There were 171 positive reactions, and 277 negative. He desired to find out whether any immunity was conferred by this vaccination; whether there was any diagnostic value in such inoculations; and whether there were individual peculiarities toward this reaction, or peculiarities due to the presence of certain diseases. A positive reaction if strong was manifested by a pimple and subsequent desquamation. Of the children vaccinated with diphtheria toxins, fifty-two suffered with tuberculosis of the bones or joints, and only ten of them showed positive reactions. There were individual peculiarities of reaction, since some of those affected with each disease showed positive, others negative reactions. The largest number of positive reactions was obtained with tonsillitis, syphilis, and chorea. Of twenty-one cases of measles, four were positive, seventeen negative. Of seventy-one cases of diphtheria, forty were negative, thirty-one positive. Of 168 scarlet-fever cases, eighty-eight were negative, eighty positive. The intensity of the reaction is in relation with the concentration of the toxin. With typhus toxin he vaccinated seventy-two children with only four positive reactions, two in scarlet fever, one in epityphlitis, and one in abdominal typhus. Of the 448 children vaccinated with diphtheria 156 were vaccinated on the other arm with tuberculin. There was absolutely no parallelism of reactions. Some reacted to one, others to the other vaccine. The author concludes that one and the same toxin reacts very differently in different individuals. Good diphtheria reactions are most often obtained in scarlet-fever patients. The author believes that angina and scarlet fever are the same disease. The characteristic symptoms of scarlatina, especially the exanthem, are due to an increased reactivity of the individual to the toxin. It is well known that patients who have had scarlet fever react easily to other bacterial poisons. These results shed a flood of light on the problem of the etiology of scarlet fever. The fact that several members of the same family will sicken at the same time with scarlatina is due to the similarity of their reactivity to the toxin, the surroundings being the same for them all. In other cases not all the children of the

same family have the disease; this is also explained by the varying reactivity of the members of the same family, with the same surroundings. These studies of the increased reactivity and of anaphylaxis will shed light on the understanding of many of the diseases of children. Such are asthmatic bronchitis, the relations of eczema and asthma, deaths from eczema, and from burns of no great extent, of scarlet fever after burns, tuberculous meningitis, etc. The study of the phenomena of anaphylaxis will be of more value than experiments on animals.

**Reaction to Tuberculin in Childhood.**—C. P. Lapage (*Brit. Jour. Child. Dis.*, 1912, ix, Nos. 107, 108) says that the reaction to tuberculin is specific, and it is a broad rule that all cases infected with tuberculosis give a reaction. The subcutaneous method gives the highest percentage of results, but the cutaneous is most practical. Human tuberculin should be used because bovine does not give reactions in all cases. The substances used to dilute the tuberculin do not in themselves cause a reaction in the strengths they are now used. The results of the clinical examination and the tuberculin test are confirmatory of one another, the reaction occurring far more frequently in those showing symptoms pointing to tuberculous infection. The x-ray examination and the cutaneous tuberculin test correspond fairly closely if their results are properly interpreted. A reaction indicates that the subject has been infected with tuberculosis and does not mean that the disease is progressive or even active. A marked reaction or a reaction in a healthy person may be of good import and need not bear a sinister interpretation. Slight reactions seem to occur more often in cases negative or only possible clinically. A negative result may follow the test in children infected with tuberculosis; (1) if the disease is advanced; (2) if there is cachexia; (3) in very acute disease; (4) in mixed infections or cases complicated by acute disease. A single negative test does not exclude tuberculous infection, repetition of the test increasing the percentage of positive results considerably (28 per cent.). Even a negative result on repetition of the test does not always exclude infection, because some cases are only positive on the third application and others, positive to x-ray examination, but neither advanced nor cachectic in nature do not react to repeated tests. Therefore, judged by the x-ray examination, the cutaneous tuberculin test cannot be regarded as absolutely reliable in excluding tuberculous infection. In some cases the first test may stir up powers which have not given a reaction at the first test, but which produce a reaction at the second test. With the exceptions noted above, and excluding faulty technic, a negative result to the test applied twice can for all practical purposes be held to mean that there has been no infection with tuberculosis. There is greater difficulty in diagnosing occult tuberculosis after the age of two years. In indicating tuberculous illness the test is of greatest value in young children. As judged by the cutaneous test on children attending at a hospital, tuberculous infection occurs in 32 per cent. up to the age of two years, in 51.2 per cent. from two

to five years, in 60 per cent. from five to ten years, and in 60.8 per cent. from ten to fourteen years. Even in cases negative to clinical examination, infection occurs on 14.7 per cent. up to the age of two years, in 31.4 per cent. aged from two to five years, in 30.7 per cent. aged from five to ten years, and in 51.2 per cent. aged from ten to fourteen years. In other words tuberculous infection is common in early life, increases rapidly in frequency up to the age of ten years, and then increases steadily but less rapidly, until at the end of school age at least 60 per cent. of children have become infected. Even in cases negative to clinical examination about 50 per cent. have become infected.

**Angina and Scarlet Fever.**—Felix v. Szontagh (*Jahrbuch f. Kinderheil.*, Dec. 4, 1912) contends that there is not only an intimate relation between scarlet fever and angina, but that they are one and the same disease, their varying degree of severity depending on the reaction of the organism to the poison to which it is exposed. There is one kind of reaction in a purulent angina and another in true scarlet fever. It often happens that when children are sick with scarlet fever the mother or another member of the family is sick with an angina, or follicular tonsillitis. The different types of disease, sepsis, pyemia, septicopyemia, endocarditis, epityphlitis, polyarthrititis, and angina are all members of one and the same family. Some anginas are really attacks of scarlet fever without exanthem. The exanthem is not a specific manifestation of scarlet fever, but simply a manifestation of a certain type of virulence of the causative microorganism. We can find no sharp line between scarlet fever and angina separating them from one another. Angina is an infectious general disease with local manifestations on the tonsils. To support this view are the bilateral affection of the tonsils, and the involvement of the pharyngeal walls. A hematogenous origin of angina is favored by the fact that peritonsillar abscess, and retrotonsillar phlegmon are often associated with angina. In scarlet fever, tongue, lips, and mucosa of the mouth are also affected. The modern doctrine of immunity shows that the reactive appearances which accompany local infections are the evidences of the struggle of the organism to fight the poison of disease. Toxic appearances are the result of bacteriolysis; the exanthem of scarlatina is one manifestation of this reaction against poisons on the part of the skin. In cases in which the exanthem is variegated on different parts of the body the prognosis is bad; there is less resistance to toxins. The same may be the case when the exanthem is not well developed. Postscarlatinal nephritis is an evidence of cumulative toxin action. It may come on suddenly or gradually. The earlier symptoms of vomiting, headache, and dyspnea are evidences of an involvement of the kidneys at the beginning of the disease. These various symptoms are but evidences of the varied virulence of the toxins, combined with the varied resistance of the organism. The exanthem is as various as the exanthem. It may cause follicular symptoms may involve the tonsils even to the stage of necrosis, may involve the nasal mucosa, and that of the aural cavity. It



may affect the hard palate, tongue and cheeks, and cause swelling of the glands and tissues of the neck, with phlegmon of the neck and skin infiltration. There may be affections of the digestive organs, arthritis, purulent or serous. If the organism be healthy it may encounter outside causes of disease, such as cold, and exhaustion, and sickness will not occur provided resistance is sufficient; but in the weakened body a slight cause may bring about a serious result, with serious complication. The varied symptoms are simply variations due to the resistance of the organism and the virulence of the microorganisms.

**Vaccine Treatment of Whooping-cough.**—A. Bamberger (*Amer. Jour. Dis. Child.*, 1913, v, 33) reports his results in the vaccine treatment of six cases of whooping-cough in children from one to four years of age. The vaccine was prepared from deep swabbings of the throat of children having pertussis, each cubic centimeter containing 20,000,000 dead organisms. The cultures are plated and replated until a pure culture is obtained; the vaccine is then made from several strains of the bacilli, so that it is polyvalent in character. There were no constitutional symptoms during the treatment and only a few small blisters as a local reaction in one case. The treatment seems rather to lessen the severity of the disease and abort complications, than to shorten the duration markedly, although only two of the writer's cases lasted as long as six weeks. The sooner the treatment is begun, the better the results. Minimum dose was 100,000,000 and maximum 300,000,000. He advises larger doses, say 500,000,000, and more frequent, as every day, as he thinks the course of the disease can be cut short by so doing. He believes this method of treating whooping-cough is deserving of a trial, as it certainly is harmless and may prove to be of great value.

**Wassermann Reaction in Hereditary Syphilis.**—The paper of L. R. de Buys (*Amer. Jour. Dis. Child.*, 1913, v, 65) is based upon 244 Wassermann reactions in 235 cases. In many instances, because of the difficulty of obtaining the blood from a very small baby, an examination of the mother's blood will suffice for corroborative diagnosis. Some of the symptoms found in syphilis may be found in nonsyphilitic cases, and a negative Wassermann is of decided help in the elimination of syphilis in the diagnosis of these cases. It is of interest to note that the blood of the father and mother react in the same way. The law of Colles has again been disproved, because if a syphilitic child is born, the mother, though apparently healthy, is in reality not so, but has had syphilis in a modified form, proof of which can be shown by the Wassermann reaction. A negative Wassermann does not exclude syphilis, as it may be obtained in cases before the antibodies appear in the circulation, or later when there is a temporary disappearance of the antibodies from the lymphatic and vascular systems due to the spirochetes being in lesions of fibrous character. A positive Wassermann, on the other hand, may be obtained in scarlet fever, leprosy, trypanosomiasis and scleroderma. However, with a very few exceptions other than



the foregoing the constancy with which a positive Wassermann is present in syphilis and a negative Wassermann is present in cases not syphilis makes it, it must be admitted, a most valuable corroborative method of diagnosis, especially in cases not presenting a typical clinical picture of syphilis.

**Leishmann's Anemia.**—Jemma (*Monatsschr. f. Kinderheil*, vol. xi, No. 7, 1912) gives the other names of this disease as infantile infectious pseudoleukemia, and infantile splenic anemia. Of this disease the author has treated sixty-three cases. This form of anemia is caused by the presence in the blood and various parts of the body of a parasite of a round or oval form, which is found to be intracellular, and to have the power of phagocytosis. The parasite is constantly found in the spleen, liver, and spinal cord, and frequently in the kidneys, intestine, lymph nodes, muscles, cerebrospinal fluid, and meninges. It is not known exactly how the parasite enters the blood current, by means of which it is spread to all the organs of the body, but it is probable that it is spread by fleas, since it is a disease common to dogs and other lower animals. It is also found especially among the lower classes, among which dogs are associated with familiarly. Some dogs are refractory to the parasite, but when they are affected the parasites are found in the same locations as in man. This disease is found in children of all ages. Out of the author's sixty-three cases only ten belonged to families in good circumstances. Anemia is shown in the skin, mucous membranes, myocardium, central nervous system, and muscles. The spleen becomes enlarged; the intestine shows catarrhal lesions and hyperemia; in the meninges are found fibrohemorrhagic inflammatory changes; the general seat of the parasites is in the lymphatic and hematopoietic structures. The parasites attack the follicular endothelium and cause changes in the reticulum and follicles, followed by necrosis. There are seen an acute, a subacute, and a chronic form of the disease. In the early stage of the disease fever of irregular type is associated with gastrointestinal symptoms; in the second, or anemic stage, there are swelling of the spleen and liver, somnolence, weakness, and emaciation. In the terminal stage cachexia precedes death. The blood examination shows lessening of hemoglobin, no change in number of red blood cells, but oligocythemia, and leukopenia. There is never a high degree of lymphocytosis; eosinophiles are present, subcutaneous hemorrhages are rare; edema is frequent in the early stage. The diagnosis cannot be made by the constant symptoms of fever, anemia, and splenic tumor; but requires an examination for the presence of the parasites in the body; for this purpose the author thinks the best method is puncture of the spleen which has been done by the author and his assistants in 200 cases without any bad effects. Although the prognosis is bad, there have been a considerable number of spontaneous recoveries. The treatment has been found unsatisfactory. The author has given cacodylate of iron, arsacetin, and salvarsan. He believes that the three cured cases which he has seen, recovered not from the treatment, but spon-

taneously. The prophylactic treatment by keeping children from associating with the lower animals, and isolation of those affected, should be enforced as a valuable preventive measure.

**Stenosis of the Bile Ducts in a New-born Child.**—K. Sugi (*Monatsschr. f. Kinderheil*, vol. xi, No. 7, 1912) details a case of stenosis of the hepatic duct in a three-weeks-old child, which had suffered from hemorrhage from the navel in the second week, but without icterus. The child died with a diagnosis of hemorrhagic diathesis and showed ecchymosis of the skin, pleura, thymus, and mucous membranes. The liver was icteric from a stenosis of the hepatic duct of inflammatory nature, the obstruction being formed of tissue granulation. The ductus choledochus was unchanged. There have been many reports of congenital atresia of the ducts but not of inflammatory stenosis. The question has been asked whether such a condition is not the result of inherited syphilis. This has been found to be the case in general; but in the author's case the lesions of syphilis were not found in the other organs, nor were spirochetes found in the tissues. The Wassermann reaction was not made, since there was no suspicion of the presence of syphilis until after the autopsy. In three autopsies made by the author in cases of congenital syphilis of the bile passages the hepatic ducts were found to be free from lesions. Possibly there was an infection soon after birth.

**Epidemic Catarrhal Jaundice.**—L. Guthrie (*Brit. Jour. Child. Dis.*, 1912, x, 1) reports ten cases of catarrhal jaundice seen by him within three months in children between three and eleven years of age. In three instances more than one member of the same family was affected. He states that mild epidemics of so-called catarrhal jaundice have been specially prevalent in England during the past three years. Although mild in character hitherto, it is possible that at any time they might become more formidable. Catarrhal jaundice must be regarded as due to an acute hepatitis resembling mumps in some particulars. The prognosis in any given case of jaundice in children, whether apparently sporadic or occurring in the course of epidemics, must be guarded; for we have no means of knowing whether it will run a mild and normal course, or terminate as a case of acute yellow atrophy of the liver.

**Incontinence of Urine in Children.**—For the treatment of incontinence of urine in children; J. W. Simpson (*Edinb. Med. Jour.*, 1913, U. S. x, 49) advises general hygienic measures. Drug treatment he divides according to the condition of the urine. If the urine is negative, the treatment consists in giving a tonic to try and improve the general condition of the child. When this has been improved the administration of belladonna should be begun, beginning with 10 minims of the tincture two or three times a day, and gradually increasing the doses up to 20 to 25 minims. If the urine is extremely acid one must first reduce the acidity by the use of citrate of potash in doses of 10 grains thrice daily; even larger doses may be required. When the acidity has been reduced, the belladonna should be begun. If the child's general health is not very good, strychnine added to the prescription is often beneficial. It is inadvisable to

give meat when the child is suffering from this "acid" condition. If the urine is alkaline dieting is of the first importance, all carbohydrate food as far as possible being prohibited. If the urine is very alkaline, acid sodium phosphate may be given; when the alkalinity of the urine has been reduced belladonna should be used in the manner stated above. A pure culture of *B. coli* is frequently obtained from the urine. If the urine is very acid it is wise at first to reduce the acidity by giving citrate of potash, then urotropin in 5 to 10-grain doses thrice daily often proves of immediate benefit. If there is mixed infection salol is often more efficacious. Mixed infection cases are often very troublesome, however, and a vaccine may sometimes be used with great advantage.

**The Secretion of Sugar-digesting Ferments in Nurslings.**—F. Lust (*Monatsschr. f. Kinderheil.*, vol. xi., No. 7, 1912) says that the functions of the digestive canal may be summed up in three words: separation, respiration and defense. The author has studied the presence of the different ferments in the intestines of fifty-six nurslings suffering from acute and chronic intestinal affections, by analysis of the feces, and tabulates his results in this article. Lactase was present in all cases tested; in a premature child lactase was also present. Maltase was never absent, whether in acute or chronic affections. In the premature child maltase was more abundant than lactase. Invertin gave very variable results. Out of thirty-four tests invertin was absent in ten. The absence of invertin action in many nurslings may be due to the presence of a large amount of cane sugar in their diet.

H. Hahn and F. Lust (*Ibid.*) consider the presence of albumin-digesting ferments, trypsin, erepsin, labferment, lipase, and diastase in the same children tested in the previous article. Trypsin was always present in the feces. In one premature child it occurred in small amount, but the enterokinase was the absent factor here. Erepsin was present in large amounts in all cases. In healthy children the labferment was always present, and in many acute and chronic affections of the intestinal canal it was also present. Diastase was never absent. Lipase was present in very small amounts in acute disturbances of digestion, with a state of intoxication, while in chronic affections it was always found, but with an acid reaction.

**Experiments with Albumin Milk.**—J. Cassel (*Arch. f. Kinderheil.*, Vol. lviii, Parts iv–vi, 1913) details his experiments in the nutrition of sick infants with the so-called albumin milk, made by evaporation of solutions of albumin. He used 180 to 200 grams of albumin to each kilo of body weight. Forty-six cases were systematically treated for a sufficient time to get reliable results. Of these there were fifteen of acute dyspepsia; three of subacute dyspepsia; nineteen of beginning intoxication; and nine of chronic dyspepsia. He found that the diarrheal symptoms soon improved, the weight increased, and a return to a milk diet was soon possible. He gives curves of weight and time at which return to ordinary milk was attempted in each case. He concludes that there is no dietetic method superior to this for treating diarrheas and dyspepsias in

infants; and that no other method allows of a more speedy return to normal diet. It is not necessary to carry on the albuminous diet for four to eight weeks, but normal diet may be begun in from ten days to two weeks in many cases. This diet is inexpensive and therefore valuable, since it is harder to get people to pay for an expensive milk than for expensive drugs.

**Persistence of Gonorrheal Vulvovaginitis in Children.**—I. C. Rubin and J. S. Leopold (*Amer. Jour. Dis. Child.*, 1912, v, 58) find that the cause of the chronicity of the gonorrheal infection in children as compared to that in adults lies in several factors: 1. The invasion is more violent and more extensive owing to (a) the close proximity of the portals of entry; (b) the tender mucosa and epidermis. 2. Once started, the infection practically develops as in a closed tube. This is not due to the valve-like closure made by the hymen, but to the construction of the perineum, and the external and internal genitals. Each segment of the vagina from the most superficial to the deepest part serves as a valve to dam back the discharge. This is due to the fact that the vaginal walls are in close contact and do not permit of natural and easy drainage. 3. Crypts and adhesions in which bacteria lodge form in the vaginal mucosa. 4. The vaginal portion of the cervix shows the deepest changes and is at the same time in the most disadvantageous position for drainage and for treatment. The writers offer the following suggestions as to the treatment of gonorrheal vaginitis: It is important to determine the extent of the deep lesion before any active treatment is begun. For this purpose the electric lighted female urethroscope should be employed. By means of the same instrument appropriate medication can be carried out. When irrigations are resorted to the douche tip or catheter should enter the vagina at least 1 1/2 inches. Applications by means of swabs used alone are useless and injurious. When strong silver solutions are applied to the cervix and vagina it is well to keep the patient in bed for a few days.

**Conservative Treatment of Tuberculous Glands of the Neck.**—J. P. Brown (*Med. Rec.*, Jan. 4, 1913) says that scrofula is a tuberculosis of the patient, not merely of the glands; hence, prophylactic and therapeutic hygiene as well as local treatment is indicated. Complete extirpation of the disease is impossible, and if given opportunity, Nature tends to cure; hence, judgment as to treatment is necessary. The glands have an important protective function; hence, the surgeon should employ no more radical method than he must, and the glands should not be carelessly sacrificed. In a great majority of the cases the removal of the caseous masses by a proper technic is all the local surgery needed. The enzymes of yeast seem to be of benefit.

**Inclusion Bodies in Scarlet Fever.**—J. Granger and C. K. Pole (*Brit. Jour. Child. Dis.*, 1913, x, 9) have examined blood films from 191 cases of scarlet fever, thirty-seven cases of measles, twenty-seven cases of diphtheria, twenty-four cases of tonsillitis, twenty cases of whooping-cough, twenty cases of serum rash, seven cases

of urticaria, four cases of pneumonia, three cases of erysipelas, and ten normal patients. The writers adopted Manson's stain at first, but later found better results, and with less trouble, by staining with carbol methylene-blue. The slides are fixed by passing three or four times through the flame after having been dried in the air. They are then dipped in water. The extra water is removed by one or two vigorous shakes, and they are then stained by carbol methylene-blue for thirty seconds (methylene-blue 1.5 grams, absolute alcohol 10 cubic centimeters, 5 per cent. solution of carbolic in water 100 cubic centimeters. The red corpuscles are not stained. The appearance of the polymorphs and bodies is the same as in Manson's stain. The writers state that except in the extremely fatal toxic type of scarlet fever, Döhle's inclusion bodies will probably be found in every true case of scarlet fever during the first four days of illness. The absence of the bodies practically excludes scarlet fever. The bodies are present in almost every case up to the fourth day, after which they appear with lessening frequency and are absent in most cases after the eighth day, though in some few cases they may be found as late as the third or fourth week. The bodies are present in quite a large proportion of cases of diphtheria, measles and tonsillitis. Therefore the presence or absence of the bodies is of no use in making a differential diagnosis between these diseases and scarlet fever. The bodies are found in most diseases caused by ordinary pyogenic organisms, especially if streptococci are present. The bodies are absent in toxic rashes. It is impossible to diagnose scarlet fever from film examination alone.

#### **Operative Treatment of Internal Hydrocephalus in Children.—**

L. M. Pussep (*Arch. f. Kinderheil*, 1912, Bd. lix, H. 3 and 4) considers the best method of operation for internal hydrocephalus. It has been found that medical treatment of this condition is of little value. The accumulation of the fluid in chronic cases is due to the closure of the openings of the brain by which the ventricles communicate with the outer surface of the brain. Since internal hydrocephalus is a symptom of various pathological conditions this closure may be due to various forms of growth. In acute hydrocephalus it is due to swelling of the tissues about the communicating vessels closing the openings. The author, in common with other observers, has seen at autopsy an obliteration of the aqueduct of Sylvius. In acute cases, the vessels being empty after death, we cannot find the compression of the plexuses. Various methods have been proposed for establishing drainage of the ventricles after trephining, by leaving in the brain a drainage tube. The result of such procedures has generally been infection of the brain substance and death soon afterward. The author proposes another method of keeping the ventricle drained after trephining. He has modified the operation of Krause, by which the fluid is conducted from the ventricle out under the skin, which is closed. The result is that there is a swelling under the scalp formed by the leaking fluid. The author conducts the fluid instead under the dura, into the subarachnoid space, thus giving no swelling under the scalp,



and yet relieving the brain pressure. The trephining is made above the ear, in the occipitoparietal region. A flap is made of periosteum and skin about 4 centimeters in diameter, and a second flap of dura mater. The brain substance is punctured with a silver needle with a small outer tube of silver with flanges. This tube is pushed in until fluid appears, and the flanges are sutured to the dura mater, so that the tube rises and falls with the motion of the membrane. The flaps of periosteum and skin are then sutured. The tube is tolerated perfectly as long as is desirable, the children being active and playing about. Meantime, the therapeutic treatment demanded by the condition causing the hydrocephalus is continued. This operation may also be used in cases of brain tumors to relieve the pain and permit of the continuance of sight up to the last possible moment. The author has performed this operation in fourteen cases, three of them of tumor, one of acute, and ten of chronic hydrocephalus. There was one death due to a very large hydrocephalus. The histories of the cases treated are given in detail. In three cases there was a manifest improvement in physical and mental condition, in others there was some improvement. It is too early to determine the remote results. This operation is easy and its immediate results are good. In well-nourished children with chronic hydrocephalus we may expect some benefit from the operation. In meningitis with acute hydrocephalus it will relieve the sufferings of the patient and assist in recovery.

**Hypodermic Injections of Oxygen in Asphyctic States.**—Bayeux (*Ann. de méd. et chir. inf.*, Dec. 15, 1912) has made clinical and experimental use of oxygen by hypodermic injection in asphyxia in infants. He has injected it in some hundreds of cases, during two years. Since his previous report at the Congress in Rome, he has used oxygen injections in the treatment of forty-eight additional cases of tuberculosis some of these for as much as two years. These injections have a favorable effect on congestion and asphyxia in the tuberculous, such as causes paroxysmal dyspnea, hemoptysis, and progressive denutrition. The general progress of the disease is stayed by the use of the oxygen, at the same time that the local lesion is improved. The oxygen restores to the blood the oxygen which the dyspnea prevents it from gaining by respiration. The painful air hunger is relieved by oxygen, and the lungs are rested from their overwork. In severe pertussis the author obtained relief from the paroxysms; and also in spasmodic laryngeal diphtheria. In dyspnea due to great altitude marked relief was obtained by oxygen. Experiments by the author upon rabbits have shown that the anoxemia of altitudes is an actual fact, and that hypodermic injections of oxygen improve the condition of the blood in these cases. The technic is simple. The author describes his apparatus for infusing the oxygen. It enables him to gauge exactly the amount of oxygen injected, which has its importance, since too much injected causes painful reaction in the subject.

**Hedonal Anesthesia in Children.**—L. E. Barrington-Ward (*Brit. Jour. Child. Dis.*, 1913, x, 17) says that hedonal given intra-



venously is one of the most pleasant anesthetics. Its administration is practically free from discomfort. Excellent muscular relaxation is obtained. In operations about the head it is of advantage not to be hampered by the armamentarium of the anesthetist. With hedonal the respiration is quiet and even throughout, and no explosive coughing occurs even when the chest is opened for empyema. The after-results of the anesthetic are excellent. The drug is excreted very slowly, and a quiet sleep for five to seven hours is usually obtained. On recovery the child is ready to take food, but inclined to sleep for the next twenty-four hours. The absence of vomiting is a noticeable feature. In its immediate effect hedonal is probably as dangerous as chloroform and much more dangerous than open ether. Its late effects, however, compare very favorably with any other anesthetic. The estimation of the depth of anesthesia is difficult. Practically the only way one can determine when the patient is sufficiently under for the operation to be begun is by noting the reaction to skin stimuli. If the skin reflex is quite absent no more anesthetic is necessary for some time and very little more will cause respiratory depression. The slowness with which hedonal is excreted demands very careful administration. The use of hedonal is contraindicated in short operations, because of the slow recovery from the effects of the anesthetic. It is contraindicated in the ordinary hospital list of operations because of the extra time consumed and the excellent results that attend anesthesia by open ether with the preliminary injection of morphia and atropine. It is the best anesthetic for brain operations. Ether is here inadmissible because of the increased hemorrhage, and prolonged chloroform anesthesia should be avoided whenever possible in children. Hedonal appears to have no irritating effect on the lungs, and therefore it could be used with advantage in any case where the lung condition contraindicated an inhalation anesthetic. Hedonal should be considered if a patient has already had a general anesthetic and dreads another operation on that account.

**Tuberculosis in Children.**—E. Pritchard (*Practitioner*, 1913, xc, 280) says that tuberculosis is the commonest of all diseases to which children are liable. The incidence rate rises from zero at birth to 90 per cent. at the age of fourteen. On the other hand, though tuberculosis is a terribly fatal disease during the first few months of life, the mortality rate among those affected rapidly falls to about 2 per cent. at the end of fourth year. Thus, as far as tuberculosis is concerned, children may be said to be highly susceptible, but, with the exception of the first two years of life, little liable to fatal results. Tuberculous disease is generally of the human type and conveyed by direct contact or through the medium of the air; the bacilli may enter the system by several routes, and they are ultimately arrested in lymph nodes, the permeability of which to solid matter is impaired, or which otherwise offer a favorable nidus for growth. The diagnosis of tuberculous disease in children must depend on a full consideration of the constitutional symptoms, of the evidence afforded by the specific tests, and of the results of a careful examination of the

lymphatic system. Although in early infancy, the gross diagnosis of a tuberculous affection is all important, in later childhood the mere diagnosis of the presence of tubercle is less important than a reliable estimation of the extent to which the tuberculous process is under the control of the natural resources for defence, and the extent to which it is likely to gain a hold on the subject. As far as infancy is concerned, the only satisfactory measure when the environment is known to be one of open infection is to remove the infant from the source of danger. As supplementary prophylactic measures, fresh air, the graduated cold bath, and an ample and varied proteid diet are useful. For older children, the one important measure, apart from the above, is to maintain their strength during the period of debility following measles, whooping-cough, and chicken-pox, and to remove them to convalescent homes in the country.

**Antityphoid Vaccination in Children.**—F. F. Russell (*Jour. A. M. A.*, 1913, lx, 344) states that no harmful effects have been reported in any of 359 children between the ages of two and sixteen years, inoculated by fifty physicians in the United States, and, so far as known, none has contracted typhoid fever, although some of the vaccinations were made over three years ago. Revaccination in children should be undertaken earlier and oftener than in adults, since children are immunized on a basis of body weight, and consequently should be given a second course of two or three doses when the weight shows a very material increase. In the absence of final information as to the duration of the immunity, we now revaccinate, in any event, after about three years; further experience may show that longer intervals are permissible. One of the most promising fields of usefulness of antityphoid vaccination in civil life is in the protection of youths and young adults, the most susceptible element of the population, against infection.

**Treatment of Heart Disease in Children** —E. Cautley (*Proc. Roy Soc. Med.*, 1913, vi, Sect. Study Dis. in Child. 57) says that in all inflammatory cases in which there is the least suspicion of rheumatism salicylates and alkalies must be prescribed. The patient is kept in bed on a light milk and carbohydrate diet, fruit and vegetable soups being allowed as a change. Blistering or counterirritants may be used, but are chiefly efficacious in pericarditis. Vaccines and serums are of problematic value. There is hope that, when the organism of rheumatic fever is isolated, an autogenous vaccine may prove beneficial to the patient. In infective endocarditis—fortunately infrequent in children—vaccines and serums have proved unsatisfactory. It is difficult to grow the incriminated organism from the blood, difficult to prove that the organism obtained in cultures is the one causing the disease, and difficult to obtain good results from an autogenous vaccine or from a polyvalent serum. Paracentesis for the relief of pericardial effusion is rarely essential in rheumatic pericarditis, for even the largest effusions may be absorbed. It is a point for discussion whether the operation would promote more rapid recovery. For purulent effusions the pericardium must be opened and drained. A more modern operation, sometimes called

cardiolysis is resection of the rib cartilages over the cardiac area, for the relief of general adhesion of the pericardium. The treatment of cardiac failure and backward pressure is the same at all ages. For extreme edema of the lower limbs multiple punctures and sterilized dressings are more satisfactory than the insertion of Southey's tubes. Iron and glycerophosphates are given when compensation is established. Compensation is maintained by regulation of the mode of life, diet, sleep, hygiene, and exercise. These patients must not be allowed to become chronic invalids. If there is merely some mitral regurgitation, the only precautions necessary are against rheumatism and overstrain. Such children ought not to take part in football, races, steeplechases, and like competitions. They may take part in other varieties of exercise during which they can stop as soon as they feel any cardiac discomfort. If compensation is less complete, more care is needed. The diet must be regulated, the bowels kept open, and the general health attended to. A weekly dose of blue pill or calomel, and digitalis once a week or more often over a long period of time, will often maintain and even increase the degree of compensation.

**Manifestations of Healthy Heart in the Young Frequently Taken as Indications for Treatment.**—J. Mackenzie (*Proc. Roy. Soc. Med.*, 1913, vi, 66) emphasizes the importance of recognizing the youthful type of irregularity, which is characterized by the varying length of the long pauses between the second and first sounds and occurs in perfectly healthy hearts. The great majority of cases showing this type of irregularity are young people. The writer has never found a single case where it has been associated with any form of heart failure. Cardiac murmurs are also often misconstrued, such murmurs being systolic in time, and their position of maximal intensity at the apex, base, or midsternum. These functional murmurs in themselves are consistent with perfect health. Where these murmurs are associated with heart failure there are invariably evidences that the heart failure is the outcome of the myocardial condition and not of the supposed incompetent valves. Functional murmurs in the young, in the absence of evidence of muscle affection, are signs neither of disease nor of impairment. The only reliable method of estimating the condition of the heart muscle is to acquire a knowledge of its efficiency, and, if it be inefficient, the extent of its limitation. This method consists in finding out how the heart responds to effort and recognizing the symptoms which indicate its exhaustion. The chief symptoms are subjective, the individual himself being conscious of his limitations.

**Is Scarlet Fever Contagious during Desquamation?**—F. M. Mead (*Med. Rec.*, Feb. 15, 1913) states that statistics show that in only a very small percentage of cases do secondary cases of scarlet fever arise from exposure to desquamation. Where the very few cases have developed from desquamation it is probable that the desquamation was infected from discharges from the nose, throat, or ears. The old-fashioned quarantine for scarlet fever should go,

and with no nasal, aural, or buccal complications, and no kidney involvement the time of quarantine for an ordinary case will be cut down to twenty-eight or thirty days.

**Surgery of the Thymus Gland.**—C. A. Parker (*Amer. Jour. Dis. Child.*, 1913, v, 89) records a successful thymectomy in a child one year old which had suffered from recurrent convulsive attacks with cyanosis. He also reviews the fifty recorded cases of thymectomy. He says that many sudden deaths in infants have been caused by an enlarged thymus producing obstruction of the trachea. Frequently this is the sole factor responsible for the compression, but at times enlarged tracheobronchial glands or spasm of the glottis are contributing factors in producing the fatal result. Compression of the trachea is shown at autopsy by the presence of a flattened trachea associated with the enlarged thymus, and is revealed *intra vitam* by the bronchoscope showing the narrowed lumen of the organ, the symptoms referable to which being completely relieved by thymectomy. The diminished caliber has also been demonstrated by intubation, only a long tube sufficing to keep the trachea open, and immediate and permanent relief following removal of the gland. Two general types of cases are observed, the continuous type in which the symptoms usually date from birth or soon after with permanent dyspnea usually present, and the intermittent type, usually of later development, in which there are longer or shorter intervals free from symptoms. The three most important symptoms in either type are permanent dyspnea, recurring suffocative attacks and stridor. All three of these frequently occur together, when their presence is an imperative indication for immediate operation. The presence of either one of the first two symptoms is an equally imperative indication for operation. Stridor alone is not an indication for thymectomy. The treatment is essentially surgical. Operative treatment—thymectomy—is as necessary and effective in tracheal obstruction from the thymus enlargement as tracheotomy or intubation is for obstruction higher up. It is frequently an emergency operation. Although the accumulating evidence is strongly suggestive that the thymus gland is absolutely necessary to life and normal development in the earlier stages of growth, its operative removal in the young human subject, as far as present evidence has shown, is not fraught with the slightest untoward metabolic disturbances. This is probably due to the fact that it is never completely removed and that the remaining portion quickly reproduces the tissues of the organ. It may also be in man, as in the lower animals, that after a certain period of growth its function is taken up by other organs, as the thyroid and spleen, and its complete removal, if it were possible, would have no baleful influence on the organism. Of the seventeen recorded deaths that occurred in thymectomized children, four followed a complicating tracheotomy and one an unclosed wound with drainage and infection. Four were due to infection from septic tracheobronchial glands. In one there was a preliminary bronchoscopy and in another there had been several unsuccessful attempts at tubage immediately

preceding the operation. In three cases with incomplete histories the operator expressly stated that the deaths were not due to the operation itself. One was in a severe case of Little's disease. In two cases the deaths occurred several weeks after operation from causes remote from if not entirely separate from the operative procedure. In no case was the operation immediately fatal. Intracapsular thymectomy is the only type of operation now employed. The vertical median incision terminating about 1 centimeter below the upper border of the sternum is the skin incision usually employed. This is the one used in Veau's operation. The low transverse incision has been successfully employed in a few cases. General anesthesia is usually well borne when competently given. The operation is easily and safely performed.

**Congenital Atresia of the Esophagus.**—J. Brennemann (*Amer. Jour. Dis. Child.*, 1913, v, 143) records three cases seen within one year. It is commonly stated that these babies are born small and weak. The writer's cases averaged nearly 7 pounds in weight. All cases of the type reported, the so-called "inosculating type," in which the upper end of the esophagus ends in a free dilated pouch, while the lower end passes from the stomach into the trachea (or, very rarely, into a bronchus), die usually from bronchopneumonia or water starvation. Loss of weight is rapid and persistent, especially during the first few days. The temperature shows a distinct elevation after the second or third day. In each of the writer's cases the skin became dry, leathery and nonelastic, and toward the end the subcutaneous tissue everywhere was board-like, so that the bones could not be felt as structures separate from the overlying tissues. The face became almost immovable, expressionless and mask-like. This condition is doubtless due to water starvation, and probably a solidification of the subcutaneous fat takes place. Attacks of suffocation and cyanosis occur in all these cases, depending in number and severity on whether the child is given food or water by mouth. It is commonly stated that babies with congenital atresia of the esophagus have a sunken abdomen. This is only partly true. In each of the writer's cases the epigastric region was distinctly bulging and tympanitic, while the lower part of the abdomen was flattened. This condition is manifestly due to the fact that air passes into the stomach from the trachea through the lower part of the esophagus, but not beyond the stomach. The diagnosis is made from the following symptoms: 1. Characteristic return of swallowed fluid from the mouth and through the nose in jets, synchronous with the act of swallowing. 2. The constant flow of saliva from the mouth and the presence of a frothy secretion before the nose. 3. Alarming attacks of suffocation and cyanosis with each attempt at mouth-feeding. 4. The attempt to pass a sound establishes the diagnosis and also the point of obstruction. The normal distance from the lips to the cardiac end of the stomach is 17 centimeters in the new-born, and the minimum diameter of the esophagus 4 millimeters. 5. The "inosculating" type can be diagnosticated when the stomach is found distended with air. No treatment so far has been of any avail.



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## ORIGINAL COMMUNICATIONS.

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IS ALBUMINURIA LIKELY TO RECUR IN SUCCESSIVE  
PREGNANCIES?\*

BY

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In the case of a large proportion of pregnant women careful analyses reveal, at one time or another, the presence of albumin in the urine. As to the frequency of its occurrence not all observers agree; but statistics(1) which have been compiled most conscientiously indicate that during the last three months of pregnancy a trace of albumin may be detected in approximately half the cases. A faint trace of albumin has usually no practical significance; its presence is often to be determined only by the closest scrutiny, tube-casts are rarely found, and symptoms of autointoxication are lacking. Under such circumstances the urine, as a rule, clears up spontaneously; or failing that, it does so upon the adoption of hygienic and dietetic measures. Even a heavy precipitate of albumin in the urine at the time of labor—observed so frequently without any untoward symptom—has, provided it disappears immediately after delivery, not the slightest practical importance.

These instances of mild and temporary albuminuria, though their causation is not an uninteresting problem, I do not propose to discuss. What I shall say relates to the very much rarer cases of persistent albuminuria, specifically, those in which the albumin is sufficiently abundant to be measured by the Esbach apparatus, in which there are numerous tube-casts, and in which the symptoms

\*An address before the Society of the Alumni of the Sloane Hospital for Women, Jan. 24, 1913.



are so outspoken as to leave no doubt of the existence of an auto-intoxication. In fact, the cases of albuminuria to which I shall refer and upon which my conclusions are based have suffered in the latter months of pregnancy either from preeclamptic toxemia or from convulsions, or the intoxication has resulted in the intrauterine death of the fetus. Severe toxemias, such as these, occur once or twice in every hundred pregnancies; they are met with even more frequently in the practice of obstetrical consultants.

In such cases, when the auto-intoxication is at its height, the outcome is often doubtful. The fetal mortality is very high for several reasons. In some instances, for example, the fetus succumbs to the intoxication, in others to the operative procedure employed for the sake of the mother, but most often, perhaps, it is born alive and dies later because of its immature development. The mother also may die but, if appropriate treatment is begun promptly, in the great majority of instances she survives. In these fortunate and relatively frequent cases the physician is almost certain to be asked: "In the event of another pregnancy will this complication be encountered again?"

We have all had to face this question and have had difficulty in answering it. Current text-books give us little assistance, nor does any monograph that I have been able to find attempt to lay down rules enabling us to offer in individual cases a reasonable opinion as to the ultimate prognosis. Each of us has learned from his own experience that there are two types of these toxemias, namely, one in which the patient has albuminuria in her first pregnancy, but not in the later ones, and another in which the patient presents this complication every time she becomes pregnant.

For several years I have been interested to learn some means by which these types might be distinguished, and, while I am not prepared to announce an iron-clad rule that will serve this purpose I believe you will be interested in certain clinical methods that are of assistance in predicting whether or not albuminuria, together with other symptoms of auto-intoxication, is likely to recur in successive pregnancies. But before discussing these methods I wish to point out that in most instances the outlook is hopeful.

Experience in private practice with cases of albuminuria, is certainly too limited to permit sweeping conclusions with regard to the relative frequency of these two types. On the other hand, such records are especially reliable, because the patients are intelligent women, the details of whose histories are accurate; and, furthermore, because the patients have been closely watched for a long time; my

patients, for example, have been under observation for a period of five to ten years. During this time, I have had, either in my own practice or have seen in consultation, eighteen women who have been pregnant more than once and who have suffered from an autointoxication in the latter months of the first pregnancy. Of these, fifteen had albuminuria only in the first pregnancy; in subsequent pregnancies, they have been free from the slightest symptom of autointoxication and they have been delivered of healthy children. On the other hand, three of the eighteen have suffered from an autointoxication in each and every pregnancy. Two of them have twice been pregnant and recovered; the third died last year of nephritis, several months after her fourth pregnancy had been terminated, on account of pronounced albuminuria.

From my records, therefore, it appears that of six women who suffer from albuminuria in the first pregnancy only one may expect the complication to reappear. The percentage of recurrence is somewhat larger among patients treated in the hospital, a fact which is explained by the custom of physicians to send to the clinic the most severe and resistant cases of toxemia. Thus, in a series of thirty-eight hospital cases who had either suffered from convulsions or from albuminuria severe enough to warrant the interruption of pregnancy, Lepage(2) found that 21 per cent. suffered from similar symptoms in later pregnancies. Among the toxemias of pregnancy treated in the Johns Hopkins Hospital, the records of which Professor J. Whitridge Williams has generously placed at my disposal, I find there was about the same proportion of recurrences. Basing the estimate, therefore, upon both hospital statistics and the experience of private practice, we may expect one of every five or six woman who have had a high-grade albuminuria in the first pregnancy to suffer from autointoxication in the second.

Obviously, it is desirable to distinguish as promptly as possible between these two types. To recognize those in which the toxemia will not recur is important, if for no other reason than to be able to reassure these women. But it is a matter of even greater importance that the other less fortunate patients, with whom the autointoxication is likely to develop again, should be warned of this fact, for if they do become pregnant, they require careful watching and explicit advice regarding diet, exercise, clothing, and sundry other hygienic details. Without such precautions, pregnancy with them is not only likely to be complicated, but it is liable actually to endanger their life. Nature, to be sure, will protect some of them by sacrificing the life of the fetus, but others will

not be so safeguarded. All of them, therefore, should receive careful medical supervision throughout the period in order that pregnancy may be terminated promptly upon the appearance of alarming symptoms; if such care is not taken, convulsions and coma may supervene, greatly increasing the chance of a fatal termination.

In the search for some means of reaching the correct ultimate prognosis for toxemias of pregnancy, it is most logical, perhaps, to look first for a difference in the clinical course of these two types of autointoxication. Occasionally, we find some distinctive feature in the history of the patient—such, for example, as a severe attack of scarlet fever in childhood—which greatly assists toward determining what may be expected in future pregnancies. Or, again, if the patient is a multipara and we learn that she has previously suffered from grave albuminuria during pregnancy, the presumption is very strong that she will repeat her former experience. In such cases, as we all know, it is typical for the toxic symptoms to appear earlier and earlier in each succeeding pregnancy and to become progressively more and more grave. When cases of repeated toxemia terminate fatally we are almost certain to find the kidneys defective, though the type of nephritis is not always the same. The liver is generally without pathological change, and, if affected, the lesions are not those widely recognized as characteristic of hepatic toxemia.<sup>(3)</sup> In such cases, therefore, the underlying pathology indicates that the autointoxication is of nephritic origin.

But it is exceptional to get a clue from the past history of the patient; and, inasmuch as autointoxication is more frequently met with in the first pregnancy than in any other, we do not often have the advantage of previous obstetrical experiences to assist in forecasting what will happen in later ones. Moreover, it is the rule, while a toxemia is in progress, to find nothing that will indicate the ultimate outlook for the patient. Thus, of two cases beginning at the same period of gestation, exhibiting identical clinical symptoms, and terminating precisely alike, one will pass through later pregnancies without any complication, and the other will duplicate her former experience. Likewise, two cases may present an identical clinical course and terminate fatally and yet exhibit at autopsy quite different pathological lesions. To illustrate these facts, though they are already well known to you, let me cite certain cases, very similar in their clinical aspect, which, nevertheless, have had altogether different subsequent histories; and also two other cases bearing close clinical resemblance but presenting different pathological pictures.

Mrs. N. K., the wife of a physician, was normal in her first pregnancy until eight weeks before her expected date. At that time, in the course of making the routine examination of the urine, a heavy precipitate of albumin was found. There was then no other symptom of autointoxication, but within a few days the patient began to complain of headache; she also had swelling of the face, of the hands, and of the feet. Although she was promptly ordered to bed and placed upon an exclusive milk-diet, the quantity of albumin steadily increased, and, at the end of a week, measured 2 grams per liter. The quantity of urine fluctuated between 1 and 2 quarts daily and contained from 7 to 9 grams of nitrogen, of which 7 per cent. was in the form of ammonia. The blood pressure rose to 160 millimeters.

The patient was persuaded to lay aside religious scruples, and submitted to the induction of labor. She was delivered of a living child which weighed 5 pounds. The mother made a speedy recovery but the child died when about eight weeks old.

Since then, this patient has had three pregnancies, and in none of them has she suffered from autointoxication. At present, she herself is well and has three healthy children.

A much less fortunate history is that of Mrs. R. N., a primipara, who had an uneventful pregnancy until the eighth month, when she began to complain of neuralgic pain in her left shoulder. At the suggestion of her husband, but against her own will, because she considered the symptom trivial, she reported it, and upon examination of the urine a heavy precipitate of albumin was found. She was ordered to bed and given a milk diet. The albumin decreased and remained at a constant level several days, but later increased and at the same time other symptoms appeared. Toward the end of a week, the amount of albumin was 2 grams per liter; there was headache, puffiness about the eyes, and swelling of the extremities. The quantity of urine varied between 1,500 and 3,000 c.c. It contained an average of 8 grams of nitrogen daily, of which 6 per cent. was eliminated in the form of ammonia. The blood pressure was 170 millimeters.

Labor was induced by the introduction of a bougie. At the end of twenty-four hours the pains were inefficient and the toxemic symptoms more pronounced; consequently, the labor was rapidly terminated. The child was lost in the delivery; the mother made a satisfactory recovery.

So far as I was able to judge from a careful study of this patient, during pregnancy, there was no difference between her autointoxication and that of the preceding patient, yet her subsequent experience has been altogether different. Recently, Mrs. R. N. has again been my patient. Albumin was not found in her urine at any time during the second pregnancy, but about the seventh month she called my attention to the fact that fetal movements had ceased. After careful observations, I was unable to hear the heart sounds, though

they had been distinctly audible on several previous occasions. One week later she gave birth to a macerated fetus. The placenta was small and extensively infarcted.

I was not surprised at this result and, fortunately, I had warned the husband of Mrs. R. N. that there was great likelihood that she would experience some complication in this pregnancy. My reason for entertaining this view certainly did not rest upon the character of her toxemia. The gloomy outlook was referable to the character of her convalescence from the autointoxication in the first pregnancy, which had been very slow. The albumin had disappeared gradually, and the blood-pressure had dropped to normal only eight weeks after delivery. Later, I shall consider the significance of these phenomena more in detail, and will indicate why these features of the convalescence seem to me valuable toward reaching the desired prognosis. But before discussing the period of convalescence I wish to illustrate how two patients having the same toxic symptoms may present different pathological pictures, for I believe that in the two patients whose histories I have just given there were different underlying pathological lesions.

The two fatal cases of toxemia to which I wish to call your attention were multiparous women, and, incidentally, demonstrate the necessity of routine examination of the urine in later pregnancies as well as the first. Both of these women were without medical supervision during pregnancy and I place little credence in the statements by members of the family that neither made any complaint until shortly before the onset of the convulsions which led to sending them to the Johns Hopkins Hospital.

A. M. (Obst. No. 5508), a negress twenty-eight years old, was near term in her fourth pregnancy. She had had one miscarriage but otherwise, in her former pregnancies, there was no complication and she gave birth to healthy children. The oldest of these is six, the youngest two years of age.

The present pregnancy proceeded normally until July 9, when the patient complained of headache, pain in the pit of the stomach, and dimness of vision. About 4 P. M., July 10, she had a convulsion; a doctor was called and, after some delay, sent her to the hospital. On admission, she was deeply comatose. Soon she had another convulsion and this was followed by others at short intervals. The patient died eight hours after the first fit. The urine (specific gravity 1.018) contained no sugar; the albumin measured 2 grams per liter. There were numerous casts of every description. The blood pressure was 180 mm.

At autopsy (Path. No. 3748), there were typical eclamptic necroses in the periportal spaces. The kidneys were normal but for swelling of the parenchyma.

M. W. (Obst. No. 3803), the second fatal case, was a white woman thirty-five years of age, at the eighth month of her fifth pregnancy. She had had two miscarriages; in the other two pregnancies there had been no complication. She has two living children, one seven years old, the other four.

The patient's husband stated that the present pregnancy had been uncomplicated until the day before she was sent to the hospital, when she complained of headache and trouble with her eyesight. While at supper, this day, she had difficulty in talking. About 10.30 P. M., she was being helped to bed when she had a convulsion. A doctor was summoned who sent the patient to the hospital as soon as the consent of the family could be obtained and arrangements could be made.

The patient arrived at the hospital in a comatose state at 3 A. M. and died a few hours later without having another convulsion. The urine (specific gravity 1.022) contained no sugar; the albumin measured 4 grams per liter. Casts were numerous. The blood pressure was 210 mm.

At autopsy (Path. No. 3196), the liver was found absolutely normal. There was a chronic diffuse nephritis. The heart was hypertrophied and there was a notable degree of arteriosclerosis. There were aneurysmal dilatations and multiple small hemorrhages in the brain. The meninges were edematous, and there was a hemorrhage in the pons. A hemorrhagic infarction was found in the lungs, and also a beginning bronchopneumonia.

Just as the similarity of the clinical aspects in the two cases, which recovered from toxemia of pregnancy, might have led us to anticipate a similar outlook for these women, so the clinical resemblance in the fatal cases might have made it seem reasonable to expect identical pathological lesions. Yet, no one familiar with such cases would have hazarded that opinion, for we know that at present there is no method by which the physician can determine whether or not the characteristic liver lesions of eclampsia are present. Likewise, from the analysis of the urine in these cases, we are not able to foretell the anatomical appearance of the kidney.

To the clinician these two fatal cases bore the closest resemblance. Both were multiparous women who had previously had normal pregnancies. The warning symptoms—so far as the record was obtainable—were identical in each. Both patients had severe albuminuria with tube-casts; in both the blood pressure was high. In these cases—and there are many like them—for the present we must leave the precise diagnosis to the pathologist.

But it is chiefly with regard to the cases which recover from toxemia of pregnancy that we feel most keenly our clinical helplessness to recognize the underlying pathological lesions. For, if we could reach the correct diagnosis, we should seldom have trouble in offering



the correct ultimate prognosis. Fortunately, in this matter we may receive assistance by studying several features of the convalescence from toxemia of pregnancy. Thus, even after these patients have begun to show decided clinical improvement, it is important to continue the routine analysis of the urine and to estimate the blood pressure from day to day. A third observation, particularly helpful in a few cases is the determination of the catalytic activity of the blood.

On the basis of such observations we may classify cases of albuminuria, associated with toxemic symptoms in the latter months of pregnancy, in three groups. Two of these groups are well defined; the members of one, we can be almost certain, will suffer from recurrence of the albuminuria in the event of another pregnancy; the members of the other are almost equally certain not to. The third group, fortunately, not a large one, consists of those cases in which there will be doubt regarding the ultimate prognosis.

Data as to the total nitrogen of the urine and the nitrogen-division during the puerperium afford, I am convinced from my observations, no help in reaching the ultimate prognosis for cases of toxemia of pregnancy. The simple estimation of the quantity of albumin is, however, very helpful. Thus, if the albumin is reduced to a faint trace in the course of a week, we can be sure that there is no permanent defect in the kidney and that the outlook for normal conditions in future pregnancies is excellent. On the other hand, a measurable amount of albumin persisting over six or eight weeks offers a very gloomy prognosis, even though ultimately it disappears entirely. In such cases the kidneys are defective and, although they may be adequate for the requirements of health in the intervals between pregnancies, they begin to show signs of strain, more or less promptly, after the sixth month of gestation. Occasionally, rigid restrictions regarding diet and exercise will serve to carry the patient to a point in pregnancy where the fetus is viable; but, as a rule, the mother suffers from grave albuminuria and gives birth to a macerated or to an immature fetus.

Using as a criterion the rapidity with which the albumin disappears from the urine, we shall find some cases which do not fit into the groups that I have just indicated. For example, the albumin may persist three or four weeks but finally disappear. In such a case it is difficult and sometimes impossible to form an opinion as to the ultimate prognosis. I have known patients of this type who passed through another pregnancy free of complications; and I have also known others in whom the toxemia reappeared. For the most part, these cases, I believe, are those in which the primary lesion was in

the liver, that is, they are cases of true eclampsia to which the renal defect is secondary. This view is favored by two facts: first, more often than not, subsequent pregnancies are normal; and second, the blood pressure drops more promptly in these cases than in those where the kidneys are primarily defective. The blood pressure, therefore, is somewhat more satisfactory than the albumin as an index. And, indeed, for other reasons the blood-pressure observations have notable advantages over the albumin estimations. It is impossible, for example, to follow accurately the changes in the albumin without having the patient catheterized, which is obviously undesirable. Furthermore, after the quantity of albumin falls below 1 gram per liter it is difficult to estimate the change from day to day. Still another advantage of the blood-pressure observations is the fact that they exclude the possibility of confusing cystitis or pyelitis with the toxemia of pregnancy.

From observations upon twenty patients who were recovering from toxemia of pregnancy, Doctor F. C. Goldsborough and I found that, using the blood pressure as a criterion, three groups can be distinguished, just as they may be from studying the urine. In every case when the toxemia was at its height the blood pressure was high, rarely below 180 mm. Typically, the blood pressure was higher in nephritic toxemia than in eclampsia; in the former we frequently noted a pressure of 250 mm. Furthermore, as each of these patients recovered, no matter what the underlying cause of the toxemia, the blood pressure finally fell, but in some instances reached normal more quickly than in others.

Fifteen of the twenty patients presented a blood-pressure curve which was near the normal at the end of two weeks. At this time, their general clinical condition was satisfactory and they were discharged from the hospital, though in many instances there was still a faint trace of albumin in the uncatheterized urine. Our opinion that these women had suffered from eclampsia, not from nephritic toxemia, and that they were unlikely to experience a toxemia again, has been verified in a number of instances. One of the typical cases I shall use as an illustration.

L. W., a primipara, had convulsions during labor and the following twenty-four hours. On these two days the blood pressure fluctuated between 150 and 180 mm.; at the end of a week it was 130, at the end of two weeks, 120 mm. Visiting her at home, a month after delivery, I found the pressure 115 mm.

Two years later, this woman was again an obstetrical patient at the Johns Hopkins Hospital. Although she had a normal pregnancy and labor, we were interested to observe the blood-pressure

and found that it fell from 135 on the first day of the puerperium to 120 on the fourteenth day.

Two of the twenty cases in our series were observed throughout a month, and, at the end of that time, presented a blood pressure of 175 mm. There was also a measurable amount of albumin in the urine, somewhat less than half a gram; in spite of these facts, and against advice, both these women left the hospital, insisting that they were well. Of the truth of this we were far from convinced and, indeed, felt unable to form an opinion regarding the ultimate prognosis in their cases. One of them, however, has since passed through a normal pregnancy. The other died later; and no autopsy was performed.

Three of our twenty patients ran a persistently high blood pressure for eight weeks and, therefore, seemed to us to have some permanent kidney defect. Our final observations of the blood pressure before these patients left the hospital were, respectively, 160, 200, and 250 mm. The first had a marked albuminuric retinitis; the second gave a history of severe scarlet fever during childhood; the third has since suffered from albuminuria and coma in a second pregnancy. Such clinical facts support our conclusion based upon the blood pressure, that the kidneys were defective in these three cases.

Reviewing our observations in this series of twenty cases, we are inclined to attach great importance to blood-pressure estimations during the convalescence from a toxemia of pregnancy. In this series, it appears to us that 75 per cent. of the women suffered from eclampsia and are unlikely to do so again; whereas, in 15 per cent. there was strong presumptive evidence of a defect in the kidneys which will always complicate pregnancy. We were uncertain of the prognosis in 10 per cent. of these cases, because the pressure remained high for a month; but the subsequent experience of one of them has demonstrated that such a condition does not necessarily mean that a toxemia of pregnancy will recur.

Certain chemical methods for estimating the efficiency of the kidney have not proved so helpful in the study of the toxemias of pregnancy as had been hoped. The subcutaneous administration of phenolsulphonephthalein, followed by estimating the rapidity with which the substance is eliminated through the kidneys, has slight, if any, value during pregnancy and the lying-in period. Normal patients in the last month of pregnancy, according to Goldsborough and Ainley(4), may eliminate it so slowly that, under ordinary circumstances, they would have been considered to have a high grade of renal inefficiency. On the other hand,

patients with grave toxemia often eliminate it more rapidly than healthy persons.

The catalytic activity of the blood, though it may prove of the greatest assistance in determining the type of toxemia with which one has to deal, does not always prove so. This method consists in estimating the amount of oxygen liberated in a given length of time from 5 c.c. of hydrogen peroxide by 5 c.c. of a 1-400 dilution of blood. It has been employed by Winternitz and Ainley(5) in the study of a series of toxemias. They were convinced that a few of these were cases of nephritic toxemia or uremia, and that others were cases of eclampsia. But the catalytic activity of the blood in other, relatively numerous, cases was such as to leave doubt concerning their identity. At autopsy in several of these, it was found that they were instances of eclampsia with marked renal involvement.

For the present, then, we have no better clinical methods for deciding the nature of a toxemia and, consequently, for reaching the ultimate prognosis than the study of the albumin and of the blood pressure during the period of convalescence. On this basis, we are able to arrive at a satisfactory conclusion nine times out of ten, and in most instances these women can be reassured, for wide experience shows that the autointoxication does not recur in approximately 80 per cent. of the cases.

I do not feel that we can be satisfied with these methods of prognosis, for they frequently fail to give the answer so clear cut as we wish; occasionally, they leave us completely in doubt regarding the outlook. Certainly some more satisfactory method can and will be devised. This will come the more quickly if investigators realize that not all the toxemias of pregnancy rest upon the same pathological basis; that some are due altogether to defective kidneys; and that in others the clinical evidence of renal involvement is purely secondary. Usually, in the latter group the efficiency of the kidney is only temporarily impaired. Bearing these facts in mind, there will be encouragement to seek some clinical means of distinguishing eclampsia from uremia, whereas, if we accept the view that all the toxemias of pregnancy have one and the same pathological basis, there can obviously be no stimulus to find a method of distinguishing between them.

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23 WEST CHASE STREET.

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## THE TREATMENT OF UTERINE HEMORRHAGE BY MEANS OF THE RÖNTGEN RAYS.\*

BY

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THE treatment of uterine hemorrhage by means of the Röntgen rays is no longer a novelty. The first cases were treated and placed on record nine years ago by Deutsch. Since then reports have been made by numerous röntgenologists and gynecologists, hundreds of carefully observed cases have been recorded, and the method has become a recognized form of treatment in the leading clinics of Europe, particularly in Germany. There has been sufficient time for all the doubts and fears to have materialized, but instead all hopes have been realized and the method stands as one of the most brilliant achievements of röntgenology. In 1911, Fraenkel(1) collected the work of 155 authors who have written articles bearing on this subject. Many of these authors have made several reports.

The technic still needs to be perfected, the indications and contraindications more clearly drawn, but sufficient good results have already been obtained to demand its recognition by all physicians who have this class of patients to be treated.

In 1904 Deutsch found that the rays relieved the symptoms of four cases of uterine hemorrhage, connected with fibroids(2). This report seemed to have been forgotten until Foveau de Courneille made a report upon forty-five cases of uterine fibroids in 1906 and upon fifty-three in 1907(3). Since then more definite technic and the indications and contraindications have been established, and the treatment placed upon a firm foundation by the work of many au-

\* Read by invitation before the Philadelphia Obstetrical Society, Feb. 6, 1913.

thors, but especially by Albers-Schonberg, Haenisch, Fraenkel, Bordeaux, Eymer, Mange and others. Dr. Mary Griscom and I presented a report upon this subject before the Philadelphia County Medical Society, Feb. 23, 1910. The present report is based upon a study of the recent literature and upon personal observations in twenty-three cases which I have treated during the past ten years (twenty-two of which were treated during the past seven years).

#### THEORY OF THE ACTION OF THE X-RAYS IN GYNECOLOGY.

It has been proven by experiments upon animals and human beings (Albers-Schonberg(4), Phillipe(5), Halberstaedter(6), Heinike(7), that the ovaries and testicles are the most sensitive of all the tissues of the body to the action of the Röntgen rays, and that these can be seriously affected without producing visible effect upon the overlying skin. It is likely that the results referred to in this paper are chiefly due to this special action of the rays upon the ovaries; and secondarily to their direct effect upon uterine fibromata when present.

If the activities of the ovaries send out a stimulus to prepare the mucous membrane of the uterus for the reception of the ovum, and the degree of this stimulation governs the menstrual flow, then the depression of this function will decrease the menstrual flow and finally lead to its obliteration. This lack of congestion and nutriment probably leads to an atrophy of the fibroids. By decreasing the hemorrhage, at least such pains as are due to the expulsion of the clots, will be relieved, and by decreasing the functions of the ovaries there is probably a decrease in the irritability of the nervous mechanism of the ovaries, thus bringing about, consequently, a relief in the dysmenorrhea of neurotic subjects.

Saretzky(8), in a series of experiments upon sixty-two rabbits, found the ovarian tissue to be especially sensitive to the rays and of the ovarian tissue the ripe and ripening follicles were first affected. Only the weakest dose showed no effect. Progressively increasing doses affected, in proportion to the quantity of treatment, first the ripe and ripening follicles, then the prefollicular cells, and finally the interstitial tissue.

At certain stages he found that a beginning atrophy of the follicles undergoes a regeneration, the ovarian tissue develops anew, and the ovaries entirely regain their functions. If the treatment is persisted in, however, a complete atrophy takes place. He found that if only one ovary was treated, the other ovary and the entire genital tract



retained their normal functions and the animal was capable of reproduction.

Based upon these theories and experiments, we easily find the explanation of the fact that as we approach the menopause the quantity of treatment needed to produce sterility and an artificial menopause is very much less than is needed in younger patients in whom the functions of the ovaries is very much more active, and the resistance greater. The resistance of the ovaries in younger people is sometimes remarkable, and on this account the Röntgen-ray treatment is not the method of choice in patients under forty years of age. One patient, age thirty-four, whom I treated over the spleen and abdomen for chronic cyanotic polycythemia, and who received a great deal of treatment over the pelvic region during two and a half years, became pregnant and gave birth to a healthy child who is now three years old.

#### INDICATIONS AND CONTRAINDICATIONS.

Prof. Menge(g) and Dr. Eymer(g) have made a careful study of 164 patients treated with Röntgen rays in the gynecological clinic of the University of Heidelberg, between January, 1909, and the early part of 1912. They give the following *indications for Röntgentherapy in fibroids*.

“(1) All cases of myoma in older women in whom there is already a well-advanced anemia, which may be the cause of an anemic heart. (2) All elderly and young women with myoma, in whom there is marked organic heart disease, diabetes mellitus, chronic nephritis, marked lung disease, and goiter with cardiac symptoms.”

In general the older the patient, and the more nearly she has approached the menopause, the more prompt and more satisfactory will be the results. With regard to age, the patients over forty give best results. Under forty Röntgentherapy is not the method of choice.

The type of tumor will influence the result very much. The intramural or interstitial variety give the best results. The subserous, pedunculated and submucous variety do not give good results and should be operated upon. In the subserous, or submucous varieties, excision might be performed, to be followed by Röntgentherapy to prevent a recurrence or further development of fibroids.

Fibroids that have undergone malignant degeneration, or that have become gangrenous should not be treated.

*Röntgentherapy is also Indicated in Metropathic Hemorrhage.*—Under this heading Eymer and Merge include: (1) Cases of *bleeding*

connected with disease of the uterus in which there is no tumor or none recognizable, cases of so-called "metritis"; (2) Cases of hemorrhagic endometritis, and (3) the climacteric hemorrhages, which are not malignant in origin.

Röntgenotherapy has also accomplished good results in some cases of hemorrhage connected with *inflammatory disease of the adnexæ* (Menge) and is indicated in those cases in which operation is contraindicated for some reason or another.

#### HEMORRHAGE DUE TO FIBROIDS.

The decrease or cessation of the hemorrhage is the first result to be expected. This effect is the more prompt the older the patient or the more nearly the menopause has been approached. Generally there is a decrease or cessation of the flow within a month or two after the first two series of applications of the rays, or after one or two full doses of the rays (10 to 20 *x*) has been given. For the production of complete and permanent amenorrhea, from one to six series of applications, or from 10 *x* to 60 *x* is needed, and this usually requires from three to six months. Usually, the period following the first series of treatments is shorter in duration, or the flow is more watery. In one Case, No. IX, the bleeding, which had been constant, stopped permanently after the first three applications of the rays (about 9 *x*). Occasionally the first period after the beginning of treatment is accompanied by more bleeding than before. This is more likely to occur in connection with submucous fibromata, or in cases of severe anemia. Therefore in very anemic women it is advisable to take all precautions and put the patient to bed after the first series of treatments. If the menses have not ceased after the sixth series, with proper technic, the case is not suitable for this treatment.

With the establishment of permanent amenorrhea, or an artificial menopause, the patient is likely to have the same group of symptoms which occur with a normal menopause. They are more likely to occur if the menopause has been produced rapidly. In my cases only three patients complained of such symptoms as flashes of heat, a dull headache and restlessness.

Case VI shows that a woman of thirty-four may have a temporary amenorrhea, disappearance of the fibroid, and reestablishment of the menses with recovery of perfect health.

With the cessation of hemorrhage, the general health improves, the patient regains color and strength, appetite and sleep improve, and the hemoglobin and red corpuscles increase to nearly normal.

The *tumor* is usually last to show any effect; occasionally it decreases in size before the bleeding ceases. Generally there is decided reduction in the size of the tumors at the time of cessation of treatment. For instance, if the tumor extends to the umbilicus at the beginning of treatment, at the end it may be the size of an orange. The tumor continues to decrease in size long after the cessation of treatment.

In Case IV the tumor originally extended to the umbilicus; at the end of two years it was the size of an orange, and at the end of five years had disappeared.

In Case VII, the tumor originally extended to the umbilicus; at the end of two years it was very much reduced, and at the end of four years could not be found. In twelve of my sixteen patients 75 per cent. who have ceased treatment, the tumor has disappeared. With the decrease in the size of the tumor, the pressure symptoms disappear.

The question of subsequent, malignant degeneration of the fibroid after x-ray treatment, has been raised by friends in conversation. There is no case on record in which this has taken place. When one considers that under ordinary conditions with no treatment, 1 per cent. or 2 per cent. undergo malignant change, this fact forms another argument in favor of the Röntgen treatment.

#### METROPATHIA HÆMORRHAGIE.

Of this group, the climacteric hemorrhages of nonmalignant origin, have been treated with brilliant results. Generally less treatment is needed than in cases of fibroid, and at times only a few applications of the rays are necessary to bring about a complete menopause. Again the older the patient, the more prompt will be the result. It is usually advisable to carry the treatment slightly beyond the production of amenorrhea, so as to make it permanent.

Cases of hemorrhagic metritis and endometritis (Menge) are treated in the same manner. In this group it is not always necessary to produce a complete amenorrhea. The production of temporary oligomenorrhea, with relief of all symptoms, may be sufficient, and this can be followed by the establishment of normal menstruation after the regeneration of the ovaries.

#### HEMORRHAGES IN INFLAMMATORY DISEASES OF THE ADNEXA.

In this class I have had no experience, and most authorities have avoided the treatment of such cases. However, since the reports of such careful observers as Eymer and Menge(10), upon their results

in this group, the Röntgenotherapy is justified when other palliative treatment has failed, or when operation is contraindicated.

They treated ten patients who had inflammatory disease of the adnexa, who suffered from menorrhagia of long duration, in which other conservative methods were unsatisfactory, and with whom they obtained good results from Röntgenotherapy. Five of these patients with gonorrhœic disease of the adnexæ were associated with palpable tumors; four other were of gonorrhœic origin but with no tumors. All patients were free from fever at the time of beginning treatment. They were given from ninety-eight to 175 milliamperes-minutes exposure.

One patient, age forty, with double puerperal tumors, after 118 milliamperes minutes (eighteen applications) developed amenorrhea. After the first application she had a severe hemorrhage. Later the pains, tumors, leukorrhea and bleeding ceased. In five other cases oligomenorrhea developed. In one case amenorrhea had lasted eighteen months. In three cases temporary amenorrhea was produced. In all there was diminished menstrual flow; in all the leukorrhea diminished, and at times disappeared, but not permanently. The tumors became smaller, or disappeared. The subjective symptoms were satisfactory. They believe the results to be due to the rays, since the symptoms were stationary for a long time with other methods of treatments.

#### TECHNIC.

In general, the object of the treatment is to depress, or obliterate, the functions of the ovaries, thus producing an amenorrhea or oligomenorrhea; and to cause an atrophy of fibroids if present, both by the action of the rays upon the ovaries, and by direct action upon the tumors. This should be accomplished without damage to the skin, the bowels or the lymphatic glands, with a fair degree of certainty, and within a reasonably short time. Therefore the greatest attention must be given to technic. To learn this technic, one must learn the principles of Röntgenography, as well as Röntgenotherapy. For instance, the man who cannot make good kidney and bladder plates, cannot understand the technic necessary to do good therapeutics in this special field. It is not easily learned, or more men would know it.

The exciting *instrument* should give a uniform current of high voltage. For this I prefer the high-speed static machine (forty plates), but an inductor or a transformer may be used.

The tube should be one that will keep a constant high vacuum of 7 to 8 Benoist. If this is allowed to get soft, the rays will be absorbed in the superficial tissues resulting in a burn, and the deep effect upon the ovaries will not be obtained. I prefer a water-cooled tube with a constant stream of cold water.

The *distance* of the target of the tube from the skin of the patient is 12 inches.

The *field of application* of the rays is over the ovaries and including the fibroid if one is present. The rays should be confined to the area treated as much as possible. If a rapid result is desired, large doses must be given, and since less than a full skin dose should be given over any area of skin within a month, the field of application must be subdivided in such a manner that by cross firing, an increased dose will reach the ovaries without burning the skin.

The *frequency* of application will vary with the circumstances connected with the patient, and with the skill of the operator. If a patient comes from a distance and must leave her home, it is desirable to get results as rapidly as possible. To give large doses in a short time, requires greater skill on the part of the Röntgenologist.

Generally the applications are made in series of from three to nine. These are usually given on successive days. When circumstances demand it, they can all be given on one day, or can be given two or three times a week. After a full dose has been given over any area of skin, this area should not be treated again within three weeks.

The *favorable time* for the treatment is immediately after a menstrual period. If the bleeding is continuous, the treatment should be given just after the time that would correspond to a period. A little less than (9 x) a full dose (10 x) should be given, and at a time corresponding in the succeeding month this should be repeated.

The *duration* of the total treatment will vary with the individual. Generally from one to six such *series* of treatments are needed (10 x to 60 x), therefore the treatment will extend over a period of from one to six months—more often from five to six months. If large doses are given by the cross-fire method, with great skill, the duration of treatment can be reduced to about three months. The duration of each individual application will vary with the technic of the operator and his apparatus. This will vary from five to twenty minutes.

The *skin dose*, or total quantity of rays applied to the surface should be carefully measured so as to avoid burns. This can be done by the Knieböck quantimeter, or by the Sabauroud and Noire discs, or Holzknacht's modifcator of the later instrument (Holzknacht radio-

meter). The units 10 x (Knieböck) or 5 H. (Holzknecht) correspond to an erythema dose.

Filters should be used to cut off the rays that are mostly absorbed by the skin. For this purpose the leather filter, first recommended by myself (Transactions of the American Röntgen Ray Society, Sept. 28, 29, 30, 1905) has served well. This consists of a layer of sole leather placed just above the diaphragm of the tube stand. Recently I have added to this a layer of 1 millimeter of aluminum. The skin dose must, of course, be measured beneath the filters.

*Skin effects* in the hands of the skilful operators have been of no consequence. In a number of patients treated, an erythema developed and in some others the skin became pigmented, or tanned. These effects disappear leaving the skin undamaged. In a few cases a dermatitis of the first degree has been produced. In these later cases telangiectases develop in the skin about a year later. If the treatment is ignorantly or carelessly given, a severe burn may of course be produced. The treatment should never be carried beyond the production of a slight erythema.

#### ADVANTAGES AND DISADVANTAGES OF THE TREATMENT.

The *advantages* are: (1) It is painless; (2) it avoids the shock of an operation; (3) it preserves to a certain extent, we believe, the internal secretion which is lost in a complete oöphorectomy; (4) it does not interrupt the usual habits; (5) confinement in a hospital is avoided; (6) in the hands of a skilful operator it is without risk; (7) the menopause is brought on gradually, when necessary; (8) the amount of treatment can be graded to the needs of the patient.

The *disadvantages* are: (1) The prolonged course of treatment that is usually necessary. This can probably be shortened by improvement in technic. If it can be reduced to two or three months, it will probably be equal to the time required for operation and convalescence therefrom. (2) There is danger to the overlying tissues, if the rays are not properly applied. By careful attention to the technic and exact measurement of the skin dose, this can be eliminated. (3) It has been claimed to be more expensive than operation. In a sense this is true. However, if one considers that by this treatment the expense of board and hospital care is eliminated, both in the case of charity and private patients, and in both instances they can go about their usual duties, I believe we must conclude that it is not more expensive.



## CASE REPORTS.

My first patient was treated nearly ten years ago, and while I obtained good results with this patient, and almost uniformly in all other cases, yet I have had the opportunity of treating only twenty-six patients in these ten years, and practically all of them have been private patients. I am not referring to this first case to lay any claim to priority, but to show the duration over which this treatment has extended.

CASE I.—A married woman, aged forty-four, was under my care for Röntgen treatment of a recurrent carcinoma of the breast. On April 9, 1903, she called my attention to a large fibroid which extended to the umbilicus. I gave her ten treatments over this area at regular intervals, each treatment amounting to about 2 x as I would interpret it to-day. There was improvement in her pressure symptoms, and hemorrhages at the end of two months. She lived about 300 miles from Philadelphia, and I have not seen her since, nor had an opportunity to make any examination. Through a mutual friend, however, I learned in September, 1909, that she was well in every respect. She had no operation. There is every reason to believe that she is well to-day, which speaks well for a patient with recurrent carcinoma of the breast and uterine fibroid ten years ago.

CASE II.—A single woman, aged thirty-nine, was referred to me by Dr. Mary Griscom in January, 1906. At this time a pelvic examination revealed a large uterus, with marked thickening in the posterior wall, and great tenderness and congestion. She reported increasingly free periods, every fifteen to twenty days, with suffering which incapacitated her for any work, and continual pelvic pain in the intervals. This interval pain seemed to be associated with a marked tenderness of the pelvic nerves. Ergot, mammary extract, etc., were tried without result. The patient had had a myomectomy a year before, which had for a time relieved the metrorrhagia. She refused to consider any further operative measures.

Treatment by means of the Röntgen rays was suggested by having seen a reference to the work of Deutsch (*Münchener medizinischer Wochenschrift*, 1904, p. 1646). No definite technic had been established. Therefore she was treated at irregular intervals and with small doses. At the end of a year, the periods were regular every four weeks, flow normal in amount, and the pain and distress had almost disappeared. Several months then elapsed with no treatment and the symptoms gradually returned, except the pain, and again the patient reported for treatment. The menstruation then occurred at longer intervals and gradually disappeared. Examination February, 1910, or four years after beginning treatment, showed the uterus in good position, slightly anteфлекed, no tenderness of the uterus, adnexæ, or pelvic nerves. No damage had been done to the skin. The general health was good and the patient seemed to be

well. There is no report since and at present she is traveling in foreign lands, but there is every reason to believe she is well seven years after being treated.

CASE III.—A single woman, aged forty-seven, a dressmaker, was referred by Dr. Mary Griscom. She had been bleeding continually for several months. Periodically the hemorrhage became so severe that she had to give up work. She was pale and weak. Examination revealed a large anteflexed uterus, with a mass the size of a hen's egg in the anterior wall. Adnexæ normal. Röntgenotherapy was begun in August, 1907. Bleeding which had been continuous stopped after the third treatment, but recurred again within a week, and ceased entirely and permanently in December, 1907, four months after beginning treatment. She regained her health completely, and has remained well since. Pelvic examination has been made repeatedly, and showed nothing abnormal during the past three years. All evidence of the fibroid has disappeared. At present she is in perfect health and is about to get married.

CASE IV.—Mrs. S., widow, aged forty-nine, had had one child who was fifteen years old. The patient had a fibroid tumor which extended to the umbilicus. She had been examined by several physicians and surgeons, all of whom advised operation, which she absolutely refused. One physician tried to destroy the tumor by intrauterine electrical operations. These were followed on two occasions by hemorrhages, which rendered her nearly bloodless, and were therefore abandoned. Pressure symptoms were severe. She was referred to me by Drs. Williams and Griscom, September 27, 1907.

I treated her three times a week until she had thirty treatments. She received 2 x at each treatment. A first degree dermatitis developed at the end of a month. This disappeared, as well as all symptoms. When examined at the end of two years she was free from symptoms, but a tumor the size of an orange could still be felt. At present, five years after treatment, she is in perfect health, and Dr. Williams reports that no tumor is palpable. Some telangiectasis is present.

CASE V.—Miss S., aged forty-eight, was referred by Dr. Mary Wilcox, October 20, 1908. Tumor was the size of a fetal head. Hemorrhages were increasing in frequency and severity. These were controlled at the end of two months, and amenorrhea occurred at the end of six months. She then developed a cystic condition about the cervix. (She had had similar attacks previously and a panhysterectomy was performed by Dr. John Deaver.

CASE VI.—Mrs. A., aged thirty-four, referred February 18, 1909, by Dr. Mary Griscom, because she was considered an absolutely inoperable case. She had two children, the younger being thirteen years of age. Three years previously she had had an incomplete abortion, at which time a fibroid was discovered in the posterior wall of the uterus. She was curetted and collapsed under the ether, though it was given with every precaution. She had valvular heart disease, with very poor compensation. She had repeated

severe hemorrhages. At the beginning of treatment she was losing blood steadily with frequent clots, and was very weak and anemic. At the end of a week, and after six Röntgen ray exposures, the hemorrhages ceased. She received twenty-six exposures in all, about 2 x at each seance. When examined at the end of a year by Dr. Griscom, the uterus was normal in size, showed no evidence of tumor and she seemed to be entirely well. When seen January, 1913, she was perfectly well. She was having normal menstruation, but had not been pregnant since the treatment though children were desired. Menses had only stopped for two months.

This case is instructive because all symptoms and even the tumor disappeared. Then after a brief period of amenorrhea, menstruation with perfect health was reestablished. It also illustrates the type of case in which one is justified in treating a patient under forty years of age. She is at present, four years after beginning treatment, only thirty-eight years of age. Since the other functions of the ovary have been preserved, one would think even pregnancy may be possible. This case also illustrates that treatment need not always be carried to the point of producing permanent amenorrhea.

CASE VII.—Mrs. M., aged fifty-two, who had had three children, was referred November, 1908, by Dr. Jeanette H. Sherman, and Dr. Mary Griscom. She had been bleeding excessively for several years. She had a fibroid tumor which extended to the umbilicus, was hard and irregular in outline, and lay mostly on the right side. She suffered from constipation. She was short, stout, and had especially thick abdominal walls. On this account it was feared the rays would not be effectual.

At the end of two months after beginning treatment, her menstrual period lasted only three days instead of two weeks. At the end of the third month amenorrhea was complete, and has remained so to the present time. Examination by Dr. Mary Griscom, February 15, 1910, the patient having had no treatments for six months, showed the tumor markedly decreased in size, and very hard. Other symptoms had disappeared. Examination by Dr. Sherman, December, 1912, showed no evidence of the tumor and the patient felt perfectly well in every respect.

This case illustrates the fact that a fat abdominal wall is no contra-indication, and that the tumor decreases in size progressively long after treatment has been stopped.

CASE VIII.—Patient was single, aged thirty-seven, and was referred by Dr. Mary Griscom on March 3, 1909. She had had a curetment four years previously for irregular bleeding. She had been bleeding almost continuously. Examination showed the uterus to be increased in size in all dimensions, but with the most distinct enlargement on the left side of the cervix, and several smaller nodules on the body of the uterus. She absolutely refused operation. She was given a series of six treatments in two weeks, taking a full dose 10 x. Treatment was interrupted for two weeks. Her bleeding stopped at the end of a month and there was none for eleven weeks. During the first three months ten treatments were given. The

patient reported for treatment very irregularly, and had some recurrence of hemorrhage. However, the last treatment was given January 19, 1912, since which time she is reported by Dr. Kraker as being entirely well.

CASE IX.—A single woman, dressmaker, aged forty-nine, was referred by Dr. Mary Griscom, January 5, 1910. The uterus was enlarged to the size of a five months' pregnancy, and she had been bleeding continuously for three months. Bleeding stopped at the end of a week, and after three treatments. At the end of five months no tumor was palpable and she seemed to be well. Since then I have lost track of her.

CASE X.—Mrs. M., age fifty, referred by Dr. Sine Stratton, March 22, 1910. Patient had been bleeding excessively, and passing clots. The uterus showed a fibroid the size of an ostrich egg. Patient refused operation. After eight treatments (17 x) in five weeks, her bleeding ceased and never returned. Flashes and nervous symptoms incident to the menopause appeared. When examined January 7, 1911 by Dr. Stratton, she was found to be well, and no tumor was palpable.

CASE XI.—Mrs. R., age fifty-three, was referred by Dr. Jennie S. Sharpe, October 18, 1910. She had been bleeding excessively for three years, and had a fibroid on the right side of the uterus which was the size of a child's head. After eight treatments (16 x) in a month her menstrual flow was scanty, and at the end of three months and twelve treatments (24 x) her bleeding had ceased entirely, and the tumor was considerably smaller. When examined by Dr. Sharpe January 1, 1913, she was perfectly well, and no evidence of the tumor could be found.

CASE XII.—Mrs. C., age forty-three, was referred by Dr. Wm. Martin and Dr. Mary Griscom, May 9, 1911, on account of marked neurasthenic symptoms, excessive menstrual flow and a small fibroid in the anterior wall of the uterus. She was given eighteen treatments (36 x) in six months. Menses became normal and her general health had returned to normal. The results in this case have not been permanent, excessive bleeding has recurred. It is evident that insufficient treatment was given.

CASE XIII.—Miss S., age thirty-three, was referred by Dr. H. W. Lowenburg, November 18, 1910, on account of a large fibroid tumor in the pelvis, which had caused marked constipation, swelling of the feet, anemia and weakness, but no excessive hemorrhage. She was also examined by Dr. Mary Griscom. We advised operation, which was absolutely refused. She had very thick abdominal walls. She was given thirty-five treatments (74 x) in eight months. The menstrual flow was diminished, but did not cease. Examination by Dr. Griscom June 24, 1911, showed a marked reduction in the size of the tumor, and we discontinued treatment. Since then no pelvic examination has been made, and no other symptoms have appeared.

CASE XIV.—Mrs. T., age fifty-two, referred by Dr. Mary Griscom, February 2, 1910, on account of excessive hemorrhage at the menstrual period, which lasted thirteen days, and a small fibroid in the

anterior wall of the uterus. After twelve treatments (24 x) in eight weeks, all bleeding had ceased. When examined May 14, 1910, by Dr. Mary Griscom, she was found to be well, and no tumor could be palpated. She writes December 20, 1912, that she has remained perfectly well.

CASE XV.—Miss H., age forty-seven, referred by Dr. Rachael Williams, August 25, 1911, on account of severe hemorrhages and a moderate-sized fibroid. She had had hemorrhages for several years, passed large clots. She suffered from the secondary effects of anemia (hemoglobin 30; red blood corpuscles 3,100,000; white corpuscles 8200). The fibroid was 4 inches in diameter and seemed to involve the uterus. She was given sixteen treatments (32 x) within three months, at the end of which time she looked quite well, had gained in weight, and all bleeding had ceased. At the end of a year there was a slight menstrual flow, through there had been an amenorrhea for ten months, and her general health was perfect. There was only slight reduction in the size of the fibroid. She had had thirty-two treatments (64 x) and has now been given six more (12 x).

CASE XVI.—Miss T., age fifty, referred by Dr. Rachael Williams, October 10, 1911, on account of a small intramural fibroid, and menorrhagia. She was given forty treatments, within eight months, at the end of which time all symptoms had disappeared, amenorrhea was complete, and the patient has remained well to date.

CASE XVII.—Miss F., age forty, was referred by Dr. Leo Bernd, August 22, 1912, on account of menorrhagia. Dr. John Hirst examined her in June, and found an intramural fibroid the size of a walnut. She received five treatments (20 x) within three weeks. This has caused a marked diminution in the menstrual flow. She has not been able to come for more treatment since.

CASE XVIII.—Mrs. C., age forty-three (colored) referred Sept. 17, 1912, by Dr. Rachael Williams on account of menorrhagia, which makes her bed fast on account of weakness. She had a fibroid the size of an orange. She was given 16 treatments (64 x) within three months. During this time she had only one short menstrual period, and none after the first month. With this her general health has improved.

CASE XIX.—Mrs. X., age forty-four, was referred Nov. 27, 1912, by Dr. Barton C. Hirst, on account of a fibroid on the left side of the uterus, with marked constipation, loss of weight, and pelvic distress. She has been given nine treatments (32 x) on each ovarian region within six weeks, resulting in a distinct improvement in her general symptoms. The time is, of course, too short to know the full result.

CASE XX.—Mrs. G., age twenty-eight, colored, married, referred by Dr. Williams to my service at the hospital, April 21, 1911. Had a fibroid the size of a grapefruit lying to the right anteriorly and a smaller fibroid to the left of the uterus posteriorly. She complained also of menorrhagia and constipation. This patient refused operation, and I accepted her reluctantly. I gave her fifty-two treatments in a year (104 x). At the end of this time the tumor showed prac-



tically no change, but menstruation had returned to normal, and she was free from symptoms.

CASE XXI.—Miss B., age twenty-two, colored, was referred by Dr. Stamm, from the service of Prof. Ashton, May 14, 1912. She had suffered from menorrhagia for two years. She had a small subperitoneal fibroid on the left side of the uterus, the size of a hazelnut. She had been bleeding continuously for several months. Dilatation and curetment had only stopped the hemorrhage for one week. After the second x-ray treatment the bleeding was diminished and ceased entirely after the third treatment. She was given fourteen treatments (seven on each side, 28 x) in five weeks. Bleeding ceased entirely, but recurred in four months. Two subsequent series of treatments were given of 10 x each, with the result that normal menstruation has been reestablished.

In addition to the above cases of fibromyoma, there was one who was operated upon three weeks after beginning Röntgen treatment, one whom I refused to treat because I found an associated pregnancy, and one whom I refused to treat in 1905 because there was no contraindication to operation, and a fourth whose hemoglobin was 20 per cent. and whom I feared would bleed to death on her way to the office, in 1907. This latter case (age fifty-one) I would treat at present.

I have also treated three patients on account of excessive hemorrhage, not associated with a palpable tumor.

CASE I.—Miss E., age thirty-two, referred by Dr. Diez May 10, 1909, on account of excessive menstrual flow, but with no palpable tumor. There were only fourteen days between periods, and clots were passed at the periods. She had been curetted two months previously, which gave no improvement. She was given five treatments (15 x) within a month, and at the end of two months her menstrual flow had returned to normal.

CASE II.—Miss B., age fifty, referred by Dr. Rachael Williams, December 15, 1909, on account of excessive menstrual flow, which recurred every three weeks (normal four weeks and three days duration). She was given ten treatments within a month (20 x). The interval between menstrual periods was prolonged to four weeks, and only slight flow. She was given twenty treatments in all, which resulted in a complete amenorrhea at the end of two months. She has remained well since.

#### CONCLUSIONS.

1. Röntgenotherapy is the method of choice for the control of hemorrhage in patients approaching the menopause, in whom carcinoma can be eliminated.

2. It is not the method of choice in patients under forty years of age.



3. It can be recommended in all cases of any age in which operation is contraindicated.

4. For the differential diagnosis, in order to determine the indications for this treatment, special skill in gynecology is required; and for the proper administration of the rays, special training in Röntgen technic is necessary. It is possible for a gynecologist to become a Röntgenologist. It is also possible for a röntgenologist to become a gynecologist, but it is very unlikely that either one will master both. Therefore, I believe that each case should be examined by a gynecologist, and treated by a Röntgenologist.

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## THE DRUG TREATMENT OF UTERINE HEMORRHAGES.\*

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THE brilliant achievements of modern surgery have so captivated the imagination of the profession as a whole, that he who even mentions the use of drugs in a medical gathering, does so at the risk of being regarded as an antiquated reactionary. Nevertheless, in the courage of my conviction, and with the enthusiasm of youth, I have ventured to accept your invitation to say a few words in defense of these ancient, but much disdained remedial agents, even in this stronghold of modern surgery.

It is a therapeutic truism that the proper appreciation of the cause of any disorder must always precede its rational treatment. Glittering generalities of this sort, however, are rarely without exceptions. There are many conditions the cause of which is either undiscoverable, or beyond our powers to rectify, in which purely symptomatic treatment is not only justifiable, but demanded. While it is, of course, imperative in the management of uterine hemorrhage to ascertain if possible, to what it is due, there are nevertheless a number of symptom measures which are applicable to a wide variety of cases.

Systematic writers on gynecological subjects generally divide the causes of uterine bleeding into local and constitutional. It seems to me that a more scientific grouping would take some cognizance of the causative pathological factors. Of the long list of morbid conditions which have been implicated in menorrhagia, practically all can be shown to act in one of two ways; they either encourage congestion of the endometrium, or they lessen the coagulability of the blood. For instance, under the first group would be included such conditions as inflammatory changes in the mucous membrane, tumors or heart disease, while under the second group we might probably place, as well as the hemophelics, patients afflicted with anemia, malaria or other disease of the blood. There are a group of cases which the gynecologist classes as hemorrhage of unknown origin. It is worthy of note that most of these patients are of unstable nervous balance, and it is not improbable that in many

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instances the menorrhagia is due to an excessive congestion, the result of abnormal sensitiveness of the vasomotor mechanism to the normal periodic dilating impulse.

The cessation of the menstrual flow, whether of normal or excessive duration, I take it occurs something in this way: There is first a gradual lessening of the congestion, and the blood, being relieved from the pressure behind, has an opportunity to form minute clots before extrusion through the epithelium, and these clots block up the torn walls of the capillaries, eventually becoming organized and absorbed. It is manifest that we can aid the arrest of the bleeding, either by preventing the accumulation of blood in the uterine vessels, or by accelerating clot formation. Accordingly we may group our remedial agents into those which act by relieving the congestion of the uterus, and those which hasten the coagulation.

It is universally conceded that the control of the circulation in the uterus is more governed by the condition of the muscle of that organ, than by the arterial muscles. Therefore, under the first group of drugs I shall consider only those which act directly on the womb.

Before considering the action of drugs on the uterine muscle, may I be permitted to say a few words on the present day ideas of its physiology. A few years ago it was widely believed, and commonly taught that most of our oxytotic drugs acted upon some hypothetical center in the lower part of the spinal cord. Present evidence throws a very grave doubt upon the existence of any such center. The origin of the motor impulses for the uterus has not yet been traced further back than the sympathetic ganglia of the hypogastric plexus. The branch of this plexus which supplies the uterus, seems to carry both motor and inhibitor fibers. Langley has shown that stimulation of the hypogastric nerve causes in the cat, when pregnant, contraction of the uterus, but in the resting condition it produces relaxation. The same difference has been shown to apply also in the case of those drugs which stimulate the sympathetic nerves. On the rabbit, on the other hand, the motor effects seem to predominate in all stages of the sexual life. While we cannot speak too dogmatically, the studies of Neu with adrenalin indicate that, in the human being, the hypogastric nerve is, as in the rabbit, preponderantly motor.

As far as is known, drugs may excite uterine contraction only by acting either upon the terminals of the hypogastric nerve, or directly upon the uterine muscle. While there is no proof of the unreliability of the nerve stimulant in the human being, the variations in cats and in dogs suggest at least a thought of the possibility of some condition in the human which might make the inhibitory fibers of this

nerve abnormally active, and that relaxation might therefore follow instead of contraction.

I have mentioned two ways in which drugs may excite uterine contraction, but I would also remind you that certain drugs which do not of themselves lead to contraction, seem to render the organ more responsive to other exciting agencies. This seems true to a certain extent of nearly all ecboic drugs, that is, when given in doses too small to originate contractions, more vigorous responses are obtained to physiological impulses. But there appear to be some substances, such as thyroid, which while never directly stimulant, yet exercise this sensitizing effect.

The first drug that I wish to consider is that grand old veteran ergot; veteran of many a campaign, not only in the sick room, but also in the scientific laboratory. For years it has withstood the most vigorous and patient efforts to wrest its secret, but it seems at last to be nearly conquered. Our ideas of both its chemistry, and its action, have been almost completely revised within the past four or five years. For example, it has recently been shown that the physiological activity of ergot is due to the presence of several principles, of which, in my opinion, the most important is the alkaloid known variously as hydroergotinin, or as ergotoxin. Besides this characteristic alkaloid, however, ergot contains several active amines, not peculiar to the drug, but found also in various putrescent protein solutions. Of this group of principles, two have so far been isolated, namely, parahydroxyphenylethylamine, which has been marketed under the trade name of tyramine, and betaiaminazolyethylamine, called for short histamine. Of these principles, ergotoxin and histamine are direct stimulants to the muscle, while tyramine acts upon the sympathetic nerve. In this connection, it is interesting to note that it has been suggested that this latter base is the hormone which, occurring in the placenta, determines the onset of labor.

Most of you have had many disappointments in the use of ergot. I wish to say a few words explanatory of the unreliability of this drug. In the first place, the alkaloid ergotoxin is soluble in water with difficulty, even in the presence of acids. From my own experiments I have reached the conclusion that about 60 per cent. of the activity of ergot is due to this alkaloid, and since neither of the two other active principles exercise precisely the same type of effect as does ergotoxin, it is evident that aqueous preparations cannot fully represent, either quantitatively or qualitatively, the physiological powers of ergot. Moreover ergotoxin seems to be, when in solution, an

unstable body; at least I have found that the fluid extract of ergot deteriorates with great rapidity, and that the quality of this drug which is supplied by the retail pharmacist, is generally very poor. In passing, I may say that the various proprietary preparations, even those which are claimed to be physiologically standardized, are still worse. One of the large manufacturing houses has recently inaugurated the custom of dating their fluid extract of ergot, and this seems to me the only possible solution of the problem of how to obtain an active specimen of the drug.

Another important agent from the older materia medica, is hydrastis. Although this drug has been employed in the treatment of menorrhagias and metrorrhagias in this country for many years, the earliest scientific experiments in which it was attributed with oxytotic powers, with which I am familiar, were those of Fellner in 1884. Although his results have been at times called into question, the stimulating action of hydrastis on the uterus in the lower animals, has been established beyond doubt.

Hydrastis contains two alkaloids of importance, namely, hydrastine and berberine. The latter has not been extensively studied, but certain investigators have obtained effects upon the uterus, which they believe to betoken a stimulation of some ecbolic center in the spinal cord. Since, however, there is grave doubt that any such center exists, and since it has been shown that berberine exercises no direct influence upon the uterine muscle, it is improbable that this alkaloid is of any real therapeutic value. The action of hydrastine has been recently elaborately studied by Kehrer and also by Laidlaw. These authors agree that hydrastine acts directly upon the uterine muscle, and excites contractions at all stages of the sexual cycle.

From hydrastine, there is prepared by oxidation, an artificial alkaloid known as hydrastinine. This is also an active oxytotic, and well deserves an important place among our therapeutic agents. The supply of hydrastis, however, has been so nearly exhausted, that the price of both hydrastinine and hydrastine has become practically prohibitive. Synthetic chemistry has been able to construct an alkaloid of very similar composition, which possesses many of the therapeutic virtues of the hydrastis alkaloids. I refer to cotarnine, an artificial product prepared from narcotine, and which is chemically a methoxy-hydrastinine. This substance has been shown to be about equal in power to hydrastinine, and although by no means a low-priced drug, is sold for about one-sixth the price of the older alkaloid.

It has recently been asserted that cotarnine is without influence upon the uterine muscle, and that its effects in hemorrhages are due to a peculiar "narcotic" effect. The narcotic theory of hemostasis is somewhat too nebulous for the scientific apprehension, and that cotarnine is a powerful exciter of uterine contractions has been experimentally proven by Kurdinowsky, Kehrer, and others. Its action, like hydrastinine, is directly upon the muscle.

Under the trade names of stypticin and styptol, the salts of cotarnine have been used clinically to a very large extent, and with general satisfaction, in the treatment of various forms of uterine hemorrhages. The dose ordinarily administered is in the neighborhood of one grain; repeated at intervals, as frequently as may be necessary, but I believe that such a dose is too small to get the full physiological action of the drug.

Among the many valuable agents which physiologists have given to clinicians, few have excited more attention than adrenaline. Very shortly after the isolation of this principle, and the demonstration of its value in controlling local hemorrhages, Cramer suggested the topical application of a solution of adrenaline in the treatment of gynecological hemorrhages. In 1901, Langley called attention to the remarkable fact that adrenaline caused contraction of the uterus in the rabbit, but relaxation in the cat. He had previously shown that electrical stimulation of the hypogastric nerve had the same antithetic influence in the two species of animals. The conclusion is unavoidable that the contractions of the uterus, which are caused by adrenaline, are due to an increased excitability of the sympathetic nerve endings. As I have already pointed out, these nerves are dominantly motor in the rabbit at all times, but in the cat and dog, only during parturition. There is abundant evidence that adrenaline is an extremely active stimulant to the uterine nerves. So sensitive is the womb to the drug, that strips of the uterine muscle have been successfully employed as a means of estimating the quantity of adrenaline in the blood. According to Kehrer, these muscle strips will react to one part of adrenaline in two hundred million.

Remembering, however, that the action is upon the nerve terminals, the question immediately presents itself as to the function of the hypogastric nerve in the human animal, and the action of adrenaline upon the human uterus. The only scientific attempt to answer this question, with which I am familiar, is the investigation made by Neu. This author injected solutions of adrenaline into the body of the uterus in a number of instances during the course of various gynecological operations, in which the uterus was visible. As a typ-



ical instance: in a patient of fifty-three years of age in whom a hysterectomy was to be done, on account of the presence of myomata, after the uterus had been exposed, he injected a syringe full of the solution of adrenaline, into the muscular wall of the uterus. Immediately the organ became "stone-hard and white," the pulse falling from 120 to 84. After this experiment, the surgeon proceeded with the operation. Neu reports in all, twelve such cases in which adrenaline was tested in nonpregnant women, with always more or less evidence of an effect upon the muscle of this organ. He does not appear to have tested the effects of internal administration of the drug in these cases. He did do so, however, in cases of labor. I quote only one instance, a case of Cesarean section, in which the intramuscular injection of adrenaline caused a violent contraction of the uterus. The muscular spasm lasted but a few minutes, but the tonus of the uterine muscle remained abnormally high for the next hour, that is, it required less amount of stimulation to cause a response, than in the normal uterine condition.

From Neu's observations, it would seem that adrenaline has two actions upon the uterus, one, an intense stimulation which is of a duration comparable to the vasomotor effect, which is followed by a much more permanent sensitizing influence.

While there is no doubt as to the ecboic power of adrenaline, and while it may be of service in certain selected cases, I do not think that the drug is to be generally recommended for uterine bleeding.

Another valuable agent for which clinical medicine is indebted to the laboratory workers, is the pituitary extract. The extract of the posterior lobe of the hypophysis, is a splendid example of the debt which clinical medicine owes to pharmacology. In 1899 Schafer and Vincent demonstrated that the injection of the extract of the pituitary body caused a rise in blood-pressure analogous, in extent at least, to that produced by an injection of the suprarenal gland. Some ten years after this, Doctors Ott and Scott, of this city, demonstrated that this drug caused violent contractions when directly applied to the uterine muscle. This discovery was made independently, about the same time, by two German investigators, Frankl-Hochwart and Fröhlich, who showed that the stimulant effect was evident, not only when the drug was applied to the uterine muscle, but also when it was introduced into the general circulation. Lead by these results from the pharmacological laboratory, a number of German clinicians, following the early reports of Bell, have employed the drug to increase uterine contractions during labor, with the most striking results. For instance, Stern reports not only a number of cases of

marked strengthening of the normal labor pains, but several in which the drug was used successfully to induce premature labor. The number of obstetricians who have reported upon this substance, and the unanimity of their opinions, leaves no room for doubt that the pituitary extract is one of the most powerful stimulants of the uterine muscle, which we possess. In cases of pregnancy, the effects of the drug have been manifested within ten to twenty minutes after its hypodermic administration and last for several hours.

While there is an abundance of literature demonstrating the value of the pituitary extract during parturition, the use of it in nonobstetrical hemorrhages does not appear to have been nearly so common. Aarons has used it in menorrhagia due to subinvolution with satisfaction. An extraordinary case has been reported by Dr. Scott, in which the use of pituitary extract absolutely controlled the hemorrhage of inoperable carcinoma.

Like adrenalin, the pituitary extract has practically no effect when ingested by the mouth. It is necessary, therefore, to give it by injection, preferably into the muscle tissue. Although the active principle of the infundibulum is as yet unknown, there are a number of solutions upon the market which are suitable for hypodermic injection.

We now come to the consideration of the second method of treating these hemorrhages, namely, by increasing the coagulability of the blood.

As is well known, the menstrual blood is less coagulable than normal. This is not due to any changes in the circulating blood, but either to the anticoagulant effect of the endometrial mucous or as suggested by Cristea and Denck, to the fact that the uterine mucosa holds back some element of the blood which is necessary to clot formation. It is, however, *a priori*, not unpalusible that if the coagulability of the blood as a whole be increased, that, to an extent at least, that of the menstrual blood will also be raised.

Three agents have been used to accelerate coagulation, namely, gelatin, calcium, and serum.

Although gelatin has been employed as a styptic, at least in folk medicine, since time immemorial the first evidence that it increased the rapidity of clot formation was brought forward in 1896 by Dastre and Floresco. The experiments upon which this conclusion was based have been vigorously assailed, and scientific investigators have alternately confirmed and denied them. The literature on this subject has been so frequently summed up that I deem it unnecessary to present in detail all the evidences for and against the action of

gelatin. I wish to quote only two papers at this time, one because of its comparatively recent date, and the other because it contains at least a plausible suggestion of the mode of action of gelatin. The first of these is by Grau, published in 1910, reporting the observations on coagulation time of ten individuals. In nine of these, there was an evident effect from the gelatin. As this author was familiar with the previous literature on the subject, and therefore with the various sources of error in the estimation of coagulation time, it seems to me that his paper deserves more weight than many of those of earlier investigators.

Moll believes that the negative results which have frequently been obtained in animal experiments on the effects of gelatin, have been due to the fact that the investigators did not wait a long enough time for the gelatine to act. After quoting various theories which have been brought forward to explain its mode of action, he gives the results of some experiments which show that the fibrinogen of the blood was greatly increased by gelatin. This action was not peculiar, however, to gelatin, but was also caused by the injection of various albuminous bodies, and even by the feeding of meat. The increase in the fibrinogen was first manifest in from nine to twelve hours after the subcutaneous injection of gelatin, and lasted several days.

Despite the inexplicable contradictions, it seems to me after an extensive review of the literature, both experimental and clinical, that the weight of the evidence is too strong to be denied that gelatin has marked hemostatic powers, in both hemopheliacs and normal individuals.

Gelatin has been used as a hemostatic, both locally and internally. The styptic effects of gelatin, when applied locally, are probably due to an agglutination of the red blood corpuscles, rather than to any specific action on coagulability. In attempting to apply the systemic hemostatic power of gelatin, we are faced with a serious obstacle in methods of administration. The intravenous injection, which was at one time employed, is absolutely unpermissible, because of the danger of intravascular thrombosis. A serious objection to the subcutaneous injection is the difficulty of satisfactorily sterilizing it. The source from which it is obtained, renders gelatin peculiarly liable to be infected with all kinds of pathogenic microorganisms, especially with the bacillus of tetanus. As is well known, this organism is peculiarly resistant, and fatal cases of tetanus have followed the hypodermic use of gelatin which had been presumably sterilized by boiling. Certain firms, however, have marketed solutions of gelatin sterilized in the autoclave, and tested upon guinea pigs to insure

sterility. This, to my mind, is the only form of gelatin whose hypodermic use can be considered.

The effect of gelatin upon clot formation when administered by the mouth, has never been satisfactorily investigated. When taken into the alimentary tract, gelatin undergoes a process of digestion analogous to that of the protein foods, being finally transformed into a substance called gelatose, which has properties corresponding to those of proteoses. Some years ago, I published the results of some experiments which led me to believe that gelatose, when introduced into the circulation, had the same effect in hastening clotting as did gelatin itself. As far as I am aware, the only other scientific evidence, either for or against the action of digested gelatin, are the papers of Moll and of Prat. The latter found that a gelatose preparation, which he called "gluton," favored the formation of thrombus after injury of the internal coat of an artery, while Moll failed to find any increased fibrinogen after gastric administration of gelatin.

The clinical reports concerning the value of orally administering gelatin are not very numerous. Some authors dismiss the subject with a mere statement that, when given by the mouth, it cannot act, without deducing the slightest evidence for their scepticism. On the other hand, Kaposi quotes two cases of good results following the oral administration of gelatin in hemophilia, and in a discussion before the "Berliner Gesellschaft für Geburtshülfe", Kroemer recommended the routine use of gelatin by mouth, in all cases of menorrhagia, where the uterine scrapings were negative. In this connection it should be remembered that the dessert called "gelatin" contains generally not more than 4 per cent. of actual gelatin, and as the efficient dose of this agent should be at least 1 ounce, it would require the patient to eat about a pint and a half of this jelly. Gelatin can best be administered orally by making a very stiff jelly representing say 25 per cent. of gelatin, of which the patient should take 3 or 4 ounces with each meal.

Another agent which has been largely used for the control of internal hemorrhages is calcium. There seems to be little room for doubt that the addition of a small quantity of the salts of lime to the blood outside of the body, hastens the formation of clot, but the studies of the coagulation time after the internal administration of calcium are fully as contradictory as in the case of gelatin. On the whole, however, considering both the clinical and scientific evidence, there seems to be sufficient grounds, to give this remedy a trial, especially as it is not likely, if unsuccessful, to be in any way deleterious.

Finally, I may call your attention to the use of blood serum for the purpose of hastening coagulation. While the serum of various animals has recently been used more or less extensively in internal hemorrhages, the only references to its use in gynecological conditions, which I have been able to find, is that of Weil. This author used blood serum from various sources in several cases of hemophiliacs, both to control and to prevent excessive loss of blood at the catamenia. He found that the serum of either the rabbit, horse, or of man is efficacious, although he ranks the human serum a little higher than that of the other animals. Where no other form of serum is available, diphtheria antitoxin, if fresh, may be used. He injected 15 to 30 cubic centimeters at a dose. He warns against the use of bovine serum, and also asserts that to be efficacious the serum must be fresh, that is, not more than two weeks old.

Perhaps I have brought you nothing new, certainly I have not uncovered any "sure cure." I have, however, endeavored to show that there are drugs which deserve at least consideration in the treatment of uterine hemorrhages. One reason that drugs are often scorned at by surgeons, is that they expect too much of them. At the best, the drug is merely one of our weapons against disease, but in a condition which sometimes resists rebelliously all forms of treatment, one should not scorn the assistance of any weapon, however humble, which seems likely to be of service.

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1905 CHESTNUT STREET.

## SURGICAL TREATMENT OF UTERINE HEMORRHAGE FROM THE NONPREGNANT UTERUS\*

BY

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THE surgical treatment of uterine hemorrhage depends, necessarily, on the cause and for convenient analysis we may divide these causes into three general classes:

A. Those inherent in the uterus itself.

B. Those inherent in the appendages, *i.e.*, tube, ovary and broad ligament.

C. Those of a remote or systemic character.

In the third class of causes, surgery plays no rôle.

In order to be systematic in this discussion, we will first consider the treatment in schedule A. In hemorrhage due to hemorrhagic endometritis, uterine dilatation with the employment of the sharp curet is indicated. A general anesthetic should be employed which gives an excellent opportunity for examination to ascertain whether there is any extraneous cause for the bleeding.

Slight and persistent bleeding may be often noted in cases of extensive cervical lacerations with eversion of the mucous membrane. In these cases either trachelorrhaphy or trachelectomy is indicated, depending on the extent of the tear and the condition of the cervix.

Mucous polypi of the cervix should be removed. Fibroid tumors of the uterus are frequent causes of hemorrhage. Here the surgical treatment depends upon the variety of tumor present. Fibroid polyps protruding from the cervix, torsion or enucleation of the neoplasm is indicated. Where the growth is an intrauterine, submucous tumor and no other other growths are evident on bimanual examination, the conservative operation of splitting the cervix and enucleation of the growth may be employed.

If the growth is a large one, the segmentation or morcellation

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operation will enable the surgeon to remove the growth and often conserve the uterus. In multiple fibroid tumors the operation of supravaginal hysterectomy should be selected, if there is no indication of degenerative change.

Abdominal myomectomy should be reserved for subserous, pedunculated growths or where there is possibly a single vesicle, subserous tumor. Personally, I believe that the practice of making multiple uterine incisions for the removal of a number of interstitial fibroids is to be deprecated. Where the uterus is the site of multiple growths varying in size, the safest plan is to perform supravaginal hysterectomy. Occasionally a curetment will temporarily relieve the hemorrhage in cases of fibroid growths; but as this is simply a temporary expedient and does not remove the etiologic factor, the patient should be informed of the palliative character of the operation.

In fibroids we have two types of hemorrhage, either menorrhagia or metrorrhagia; and it is well to emphasize the fact that a small submucous growth will often produce excessive bleeding, whereas in larger interstitial or subserous tumors, hemorrhage may be a minor symptom. The most important cause of uterine hemorrhage is cancer, either of the cervix or of the corpus uteri. In cervical cancer, the diagnosis is usually made with greater ease than in malignant disease of the body of the uterus. If there is doubt as to the diagnosis of incipient cancer of the cervix, the knife may first be employed for the excision of a fragment of tissue for microscopic examination. When the diagnosis is positively made, then we are all agreed that complete hysterectomy either by the vaginal or abdominal route is indicated.

In suspected cancer of the body of the uterus, the first surgical procedure indicated is a dilatation of the uterus by one of three methods, parallel bar dilators, the bougies or the metranoikter and the removal of suspected tissue by a sharp curet for microscopic examination. In some cases the dilatation is sufficient to permit the introduction of a finger into the uterus which aids in diagnosis; and if the diagnosis of malignancy is confirmed, complete hysterectomy is indicated.

There is one melancholy class of cases which we frequently see, and that is the class of advanced cases of cervical cancer in which radical procedures would be deemed futile or unwise, and yet much may be done for the relief of hemorrhage in these cases by the use of the serrated curet, the Paquelin or electrothermocautery followed by the systematic use of acetone. The effect of this remedy is to check the oozing, alleviate the disagreeable odor and lessen the

offensive discharge. The use of the x-ray has been already considered by another writer in this symposium.

In other malignant types of uterine disease such as sarcomata, endotheliomata and chorioepitheliomata, the same surgical treatment is indicated as in carcinoma, and that is complete hysterectomy as soon as the diagnosis is made.

One annoying condition which is sometimes noted is persistent uterine bleeding after double salpingoophorectomy. This may be due to the inadvertent retention of some ovarian tissue; but very often these patients require a secondary celiotomy and supravaginal hysterectomy before relief is afforded.

Malpositions of the uterus may be properly included in Class A and hemorrhage is very frequently a symptom to such displacements and is due to uterine congestion and hypertrophy of the endometrium.

In inversion of the uterus of the chronic type, which only is included in this discussion, the removal of the fibroid tumor which is the usual cause of the inversion, is indicated first and then the restoration of the uterus to its normal position, if possible, and if not, its extirpation. In retrodisplacement of the uterus, the dilatation and curetment of the organ followed by a ventral suspension or shortening of the round ligaments by the Montgomery or Baldy methods, will give relief.

In prolapsus of the uterus surgical treatment will depend upon the degree of prolapse. In second and third degree cases, plastic operations on cervix, anterior vaginal wall and pelvic floor should be done and these supplemented by a ventral fixation of the uterus, or one of the round ligament operations frequently mentioned. Supravaginal amputation of the uterus followed by fixation of the cervical stump to the abdominal wall can be selected when there is a great amount of relaxation and will often relieve all symptoms when less radical measures would fail.

*Class B.*—Under this heading are included those causes inherent in the appendages or broad ligament. Chronic salpingoophoritis or hydrosalpinx, hematosalpinx or pyosalpinx by interfering with the pelvic circulation may produce hemorrhage from the uterus. In such cases the curetment should be followed by the extirpation of the diseased appendages. If both appendages are diseased, and the uterine body is much congested or is mutilated during the enucleation of the appendages, it is well to remove that organ as well as the appendages in order to preclude possibility of subsequent hemorrhages from the useless remaining organ.

Ovarian tumors, either solid or cystic, and parovarian cysts often

cause bleeding and the removal of the neoplasm usually produces a cessation of the symptoms. Pelvic abscesses, another etiologic factor, can be primarily drained by vaginal section and later if symptoms persist abdominal section with enucleation of the sac be performed. It is not within my province, in this paper to consider Class C, or those remote or systemic causes such as diseases of the heart, kidneys, liver, etc. which affect the circulation of the uterus. The point of paramount importance is that a thorough investigation should be made to determine accurately and positively the cause of the uterine bleeding. In order to do this it is often necessary to use a general anesthetic and to instrumentally dilate the uterus before giving a definite opinion to the patient or her physician. I conceive it to be the duty of this society to particularly emphasize the importance of postclimacteric bleeding which is so frequently due to malignant disease and the significance of which is so often unappreciated by the practitioner. As has been well said "postclimacteric bleeding should always be regarded as a danger signal demanding careful and painstaking examination."

127 NORTH TWENTIETH STREET.

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## THYMUS DEATH IN THE NEW-BORN, WITH REPORT OF A CASE.\*

BY

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THE mother, Mrs. F. C., aged thirty years, applied for medical care to the Wharton Street Maternity Dispensary of the Jefferson Hospital, stating that she was in a pregnant condition, near term, and having vaginal hemorrhage. The dispensary staff found that her statement was true and that she had been suffering from irregular bleeding for several days.

On examination, she was in a fairly good condition, beginning to show the effects of bleeding, the child living and in fair condition, and a low attachment of the placenta, with partial separation, was evidently present. She was brought by ambulance to the Jefferson Maternity, and delivered as soon as possible by Cesarean section.

The membranes were unruptured. On opening the uterus it was observed that the child moved violently in the membranes, and during the brief time occupied in delivery several respiratory movements were made. The child was a female, weighing 6 1/2 pounds, of average development, and fairly well nourished.

The mother's convalescence was uninterrupted.

Especial attention was given to the infant as it was thought that

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possibly it had inspired amniotic liquid at the moment of birth. It cried naturally, and did well for twenty-four hours, but it died in spasm, with dyspnea. During the life of the infant its neck and thoracic region presented nothing abnormal, although in the new-born the upper portion of the thymus can sometimes be felt, if the child be thin and ill-nourished.

Postmortem examination of the infant showed a greatly enlarged thymus in both lobes, extending down into the anterior portion of the chest. The substance of the thymus had not undergone essential alteration.

The anatomical study of the thymus shows a mass of lymphatic tissue without connection with the respiratory mucous membrane or with the thyroid gland. It is derived from the ectoderm of the third gill cleft of the embryo. Its blood supply is very free, derived from the subclavian, carotid, internal mammary, and thyroid arteries. It grows rapidly during the seventh, eighth and the ninth months of intrauterine life, and for some time after birth. Its function is unknown.

Tumors in the region of the neck may occasion dystocia and require embryotomy for the termination of labor. These cases indicate that the thymus may be abnormal before labor, but throw no light upon the part which it plays in sudden death after birth.

Sudden death in the new-born may arise from causes other than conditions of the thymus.

Haberda(9) draws attention to sudden death in infancy in diseases of the lungs and intestine.

Neumann(14) Emphasises the necessity for caution in ascribing sudden death in infancy to conditions of the thymus without anatomical proof of its occurrence.

Hammar(6) believes many cases of alleged thymus death should be referred to some condition of the heart. The part which the thymus plays in these cases is the formation of a toxin which acts poisonously upon the circulation.

Hart(7) takes essentially the same ground.

Cases of compression of vessels and nerves by the enlarged thymus have frequently been reported, some of them complicated by syphilis.

1, Barbier; 2, Beneke; 8, Hutinel; 10, Kaessmann; 11, Lund; 17, Rolleston and 12, Moizard.

Warthin(19) reported cases of partial stenosis of the larynx occurring as the result of enlargement of the thymus in the new-born.

In the discussion of this paper, Holt, Blake, and others confirmed the observation, and Jacobi drew attention to the fact that stridor might occur in bronchial pneumonia.

Moscoso(13) has observed stridor following enlarged thymus.

The congenital aspect of thymus death is illustrated by Griffith's paper(5), where seven deaths occurred in one family in children aged from one to eight months. Bronchitis was present in some, and autopsy revealed an enlarged thymus.

Sabatier(18), while admitting a connection between sudden death in the new-born and hypertrophy of the thymus, draws attention to the fact that the essential factor in these cases is an altered state of the blood, and that one will find in the meninges, suprarenals, and other regions of the body where circulation is free, or blood is formed, evidences of the essential lesion. That enlargement of the thymus may be accompanied by stenosis of the trachea, not relieved by resection of the thymus, is shown by Weill, who reports the case of a child in convulsions which persisted after the thymus had been resected, and which at autopsy was found to depend upon stenosis of the trachea.

Planchu(15) and Rendu, in the case of an infant dying after two attacks of dyspnea, found miliary abscesses in the hypertrophied thymus.

Doubt is cast by Carlyll(3), who has collected sixty-one cases of thymus death, and believes that the relation between this occurrence and so-called status lymphaticus has not been clearly established.

Without multiplying references as to the causation of thymus death, we may draw attention to the fact that the embryology and histology of the gland indicate that it is intimately concerned with the blood-making and metabolic processes of the fetus. Recent studies in relationships existing between the placenta and the thyroid gland suggest that the large thymus in the new-born must share in various disturbed conditions of maternal and fetal metabolism. In abnormal states it is reasonable to suppose that it adds a toxin to those formed in the placenta and in the ductless glands of the fetal body.

A possible reason for its sudden enlargement after birth may be found in the measures sometimes taken to establish respiration in the new-born. The most simple and universally employed method consists in folding and unfolding the body of the child in such a manner as to encourage the circulation of blood through the lungs and thorax. A delicate lymphatic organ, like the thymus, composed of lymph follicles, and with a very rich blood supply, might easily become surcharged with blood during this manipulation, and its sudden engorgement through mechanical pressure might bring about death.

These suggestions are based, first, upon analogy between altered conditions of other ductless glands of the fetal body and sudden death; and second, on reported results of treatment addressed to the relief of mechanical pressure. Thus, d'Oelsnitz, Prat and Boisseau(4) report a case of impending death with thymus hypertrophy temporarily relieved by resection of the thymus, accompanied by partial resection of the manubrium sterni. The child died from infection and the remaining portion of the thymus was found sclerotic and adherent to the trachea.

Weill's case(20), already quoted, where partial resection of the thymus was unsuccessful and death followed from stenosis of the trachea, shows that operation may be followed by inflammation and adhesion of the remaining portion of the gland to the trachea. Abscess in the enlarged thymus, to which reference has already been made, suggests evacuation of pus by incision.

When one remembers that the enlarged thymus has been found deep in the chest surrounding the carotid artery, the possibility of a considerable resection in the new-born becomes remote. Thus Penkert(16) reports two cases in which the thymus measured from 6 to 7 centimeters in one dimension, and 1.5 to 2 centimeters in another. Other cases had what must have been much larger glands, but without accurate measurements.

In the case reported it is possible that the mother's hemorrhage had altered the condition of the fetal blood, and in consequence produced alteration in the size and condition of the thymus. That the gland was enlarged before delivery is shown from the fact that the fetus was observed to make inspiratory movements of an unusual character before the membranes were opened. Evidently the disturbance of eventrating the uterus and compressing the lower segment to control hemorrhage was sufficient to influence the fetus.

It is difficult in the present state of our knowledge to suggest measurements for preventing thymus death. Attention to the mother's hygiene during pregnancy is certainly demanded. Delivery by Cesarean section exposes the child to the least possible mechanical disturbance, so that in this case birth pressure was absent; no prolonged or vigorous efforts were made to establish respiration.

A further study of the thymus from the standpoint of toxins and sera may throw light on this obscure condition.

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THE ABSTRACTION OF CALCIUM SALTS FROM THE  
MOTHER'S BLOOD BY THE FETUS, THE CAUSE  
OF THE RAPID PROGRESS OF TUBERCULAR  
PROCESSES.

BY

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ALREADY in several published articles I have attempted theoretically to advance the theory that the abstraction of calcium salts from the mother's blood by the fetus is responsible for many of the pathogenic processes in her body, viz., osteomalacia, puerperal eclampsia, fatty infiltration of the liver, large white kidney, softening of the teeth, etc. That the calcium salts may and do play an important part in the animal economy I think all are ready to admit; but just how extensive is their action we do not yet know. Probably many obscure processes may be controlled by them. Deficiency of these salts is thought to be the cause of many obscure conditions. Some work has already been done to show that tubercular conditions progress more rapidly when these salts are present in the body in a diminished quantity. We have all observed the rapid development of pulmonary tuberculosis after several pregnancies in women who may have shown evidences of the disease before marriage or who belong to families so afflicted. Such women may pass through the first pregnancy well, the second not so well, and the third disastrously, that is they are never well after it and soon show signs of serious pulmonary tubercular disease. At every pregnancy the system has been drained more and more of its calcium salts and finally the amount necessary to combat the tubercular process is not present. Whether in the presence of this microorganism the calcium salts are necessary only for the purpose of calcification of the tubercular areas—that is, areas of lung tissue infected by the tubercle bacillus—or whether there may be other functions for it to perform in combating the diseased condition is not known, *i.e.*, whether it is a mechanical protective action or a chemical one. The former would, however, be in itself a very important rôle for it to play. Supposing this to be one of its main functions in the presence of tubercular disease; then one of its normal functions of combining with free fat in the tissues of organs and thus forming

soluble fats or lipoids—the state in which the fat in the tissues is conveyed to the normal depôts of free fat in the body—is interfered with. Now if the calcium salts of the body be reduced by the drain of pregnancy and lactation, there will not then be a sufficient amount of calcium to combine with the free fat formed normally in some of the organs, as for example the liver and the kidneys; and thus free fat will be retained in them—fatty infiltration of the cells taking place—and will prevent the perfect functioning of these organs, this condition later on leading to fatty degeneration of these tissues. If these organs then either on account of their condition of fatty infiltration or degeneration—this latter being a later change—are unable to perform their functions and to eliminate toxic substances formed in the body of the tubercular person then these latter will accumulate there and hasten the death of the patient. If antibodies shall in any way pertain to the nature of a lipoid substance, then if the calcium salts are diminished, the beneficial action of the antibodies will be absent. Often the tubercular process develops very rapidly after pregnancy and the same resistance is not displayed. The florid type may be present because there being a great scarcity of calcium salts in the body there is not an amount sufficient to combine with the fat in the normal depôts of free fat, subcutaneous tissue, omentum, etc., to form again lipoids which may serve as a source of food in this time of stress; therefore the fat in the subcutaneous tissue remains there and the patient does not present an emaciated appearance. If the woman does not replenish to the full her loss of calcium during pregnancy and lactation, but continues to fall shorter and shorter every succeeding pregnancy, at last she must possess little of it and consequently has not sufficient to remove the fat from her organs to the normal depôts and has not sufficient amount in her body to fight the disease. Every pregnancy she is worse off.

The tubercle bacillus is ubiquitous and finds a ready soil in such cases.

Feed calcium in the food and in the free state to pregnant women. Milk should be consumed in quantities. It is now a question whether the so-called predisposition to tuberculosis may not be nothing more nor less than a lack of calcium in the body. Children born of parents in whom there is a scarcity of calcium will be born with less than the normal amount in their bodies and unless they receive special care this deficiency may not be met and therefore their bodies will be unable to (perfectly) perform all its functions

in which the calcium salts play a part and these later on may be shown to be not a few. It is a fact that in many autopsied bodies there are found healed tubercular lesions. These evidently had the sufficient amount of calcium to combat the disease by the calcification of the affected areas; those in whom tuberculosis is the cause of death do not possess a sufficient quantity.

#### CONCLUSIONS.

1. Pregnancy drains the body of its calcium salts.
2. Lactation drains the body of its calcium salts.
3. Therefore there is less calcium for the process of calcification of the tubercular areas—nature's method of cure in tuberculosis.
4. Therefore the rapid course of tuberculosis after pregnancy, increasing after every succeeding pregnancy until the woman succumbs generally after the third.

WADSWORTH HALL, ARROCHAR, L. I., N. Y.

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## TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRI- CIANS AND GYNECOLOGISTS.

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### IDIOPATHIC PERITONITIS.<sup>1</sup>

BY

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Miss S. M., twenty-eight or thirty years old. Father, mother and sister died of tuberculosis. Patient has never been very strong. On Monday, January 29, 1912, the patient had a sore throat that lasted for a few days, from which she recovered. Friday night, February 2, patient had some pain in the right iliac fossa, but slept all night. Saturday morning went to work. While at work, she was taken suddenly with a sharp pain in the abdomen without any localization. It extended diffusely all over the abdomen; she could hardly walk unless bending forward. Vomiting became extremely frequent from the start; she had diarrhea at the same time. No fever, no pain on pressure in the abdomen, which was absolutely soft everywhere. Sunday and Monday patient continued to vomit and have diarrhea. She still complained of diffuse pain in the

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

abdomen. Her general condition grew rapidly worse. Monday, for the first time, her temperature reached 102° F. Abdomen distended, but no localization of tenderness; menstrual period started the same day. Dr. Sellenings and Dr. Winders, called in consultation, declared the patient had a general peritonitis. Her general condition grew rapidly worse. Wednesday, February 7, at 8 o'clock, I was called in to see the patient by Dr. Sellenings.

*Physical Examination.*—A glance reveals the fact that patient is very sick. The face is pale, eyes sunken with a black circle under them. Nose is pinched and cold. Tongue is still moist. The hands and feet are cold and blue. The pulse is running about 125, is thready and hardly noticeable. Patient has been vomiting during the night and morning. Diarrheal stools very frequent.

Examination of the abdomen shows a general tympanitis, with its maximum over the mesogastric region. Percussion shows a tympanitic sound over the whole abdomen, though slightly diminished in the pelvic region. The abdomen is not sensitive to superficial pressure, but deep pressure, suddenly released, elicits pain. A careful palpation does not give any indication of resistance. No abscess formation as far as the palpation is concerned. The tympanitis is quite marked. Vaginal and rectal examination negative—no tumor, no abscess, no inflammation whatsoever. The uterus is of normal size; the ovaries and tubes cannot be detected, owing to the tympanitic condition of the abdomen.

*Diagnosis.*—General diffuse peritonitis, probably due to a perforation of an appendix or possibly of a duodenal or gastric ulcer, although there was no history of digestive trouble before this acute trouble.

*Treatment Advised.*—Owing to extreme condition of the patient, the hands and feet being cold, pulse thready, the tympanitis so marked, an operation which I considered first as feasible, was soon discarded, because I could see that the patient was losing ground steadily. She died at 11 o'clock, three hours after my consultation.

*Autopsy.*—Upon opening the peritoneum, a great quantity of purulent fluid escapes, sanious, yellow-greenish, odorless. The intestines are distended, especially the jejunum, duodenum and stomach. There are in places thin, fibrinous deposits. The peritonitis is diffuse, general; no tendency to encapsulation. A careful examination of the appendix shows that this organ is normal. The uterus, ovaries, and tubes are normal. The jejunum, the ileum, the cecum, the ascending and transverse colon show no trace of inflammation. In no place is there any trace of ulceration. The duodenum, ascending, descending and transverse, although quite distended, shows no trace of ulceration whatsoever. Stomach and pylorus absolutely normal. No glands in the mesentery, except a very small one of the size

of a pea which shows nothing abnormal. Kidneys normal in size and appearance, capsule absolutely normal, detached without breaking away small portions of the parenchyma. On cut surface, the kidney shows a cloudy swelling, likewise the liver and the spleen. The liver is quite enlarged, the enlargement affecting mostly the left lobe. The spleen is firm, shows no trace of softness; pancreas absolutely normal. The small cavity of the peritoneum is normal and the foramen of Winslow is normal. Bladder absolutely normal.

In the pleural cavity, the left lung shows a fibrinous deposit the size of a dollar, but no trace of pneumonia or of bronchitis is found. In the right lung, there is an infarct the size of a fifty-cent piece, the lung is very adherent and reduced in size, and shows a small old tuberculous focus in the apex. Otherwise, no trace of bronchitis or pneumonia. Heart very small, shows an enlarged ventricle with a very thin musculature. The left ventricle is small with diminished musculature. The heart shows a brown atrophy. The valves are normal, no clot.

The autopsy does not reveal anything which would suggest the cause of this general peritonitis. The staining of the pus taken from the pleural cavity and from the peritoneum shows that we have to deal with a streptococcus. A swab of the throat also reveals the presence of a great quantity of streptococci. Culture shows in the

Swab of the throat . . . . .	streptococcus, predominating.
Pleural patch . . . . .	streptococcus, pure culture.
Peritonitis pus . . . . .	streptococcus, pure culture.

A few years ago I saw a very interesting case which I am going to report briefly.

A boy, six years old. Has always been in excellent health. While sleeping, he woke up suddenly with a sharp diffuse pain in the abdomen. The little boy had not eaten anything previously, out of the ordinary. Fever was quite high, ranging between  $103^{\circ}$  and  $104^{\circ}$  F. He vomited incessantly a greenish fluid. At the same time, bowels moved frequently. Patient remained in this condition with fever, vomiting and diarrhea for about four days, then the vomiting ceased, but the diarrhea and the temperature persisted for about five weeks. Patient lost flesh and became exceedingly emaciated. In the meantime, the abdomen distended gradually, the maximum of the distention being localized in the umbilical region. The umbilicus became unfolded and slightly red. A dullness and fluctuation was present in this area.

The diagnosis of tuberculous peritonitis was made and I was invited to witness the operation. As soon as the abdomen was opened, a yellowish, thick, odorless pus came out. This pus was encapsulated, the walls of the cyst being formed by thick, heavy,



fibrinous membrane. Culture of the pus gave a pure culture of pneumococci. The boy made an uneventful recovery. This was a typical case of a primary pneumococcic peritonitis.

Peritonitis has been for years a subject for study by the internists and pathologists, and still the question arises whether there is such a condition as primary or idiopathic peritonitis.

By primary or idiopathic peritonitis we mean such cases of infection of the peritoneum in which the organism shows absolutely no anatomical changes, except those of the peritoneum, in which no other tissue, structure or organ is affected and in which the inflammatory irritant acts directly upon the peritoneum, without producing any decided alterations whatsoever in other organs in its path.

It is evident that the question is more properly to be solved by the pathologist, rather than the clinician, for the latter will often fail to observe changes *intra vitam*, which are later discovered by the former.

Secondary peritonitis, occurring in patients suffering from acute or chronic diseases of the abdominal cavity, is exceedingly frequent. This is an every-day experience for the surgeon, but primary and virulent infection of the peritoneum of a healthy individual is certainly very rare. In such cases, the source of infection cannot be determined at autopsy. Osler reports twelve such cases in 102 autopsies, and in 125 postmortem examinations made in the Montreal Hospital on patients who died from peritonitis; there were five in which the cause could not be definitely determined. The five autopsies above mentioned were all in females. In two of these, death was due to a widely generalized streptococcic peritonitis. In the third case, the infection was apparently due to pneumococci. In the two remaining cases, the bacteriological findings were not recorded.

It is interesting to know by what channels the excitant factor enters the system and affects the peritoneum. The infection in primary or idiopathic peritonitis may reach the peritoneum by four ways: *First*, by the blood stream. *Second*, by the lymphatic channels. *Third*, in women, through the genital apparatus. *Fourth*, bacteria pass directly through the intestinal wall without leaving any trace of their passage.

*First, by the Blood Stream.*—When peritonitis is the consequence of a septicemia or of an infection localized far from the peritoneum, as for instance erysipelas of the face, or tonsillitis. In such cases, peritoneal infection is regarded as a *hematogenous*

infection. But how do such microbes reach the blood stream? If a cross-section of erysipelatous skin is examined under the microscope, the lymphatic channels will be seen gorged with streptococci; from this, it is readily understood how they will reach the blood stream, but I have no explanation to make as to why such microbes localize in the peritoneum in preference to other organs.

Tiser, after recent experiments, concludes that bacteria circulating in the blood do not enter the serous membrane, so long as this is uninjured, but after the membrane becomes slightly irritated or inflamed, then circulating organisms very quickly gain a foothold. The result of the invasion depends on the individual resistance and the virulence of the organism. In fetal peritonitis, infection of the peritoneum takes place through the placenta and the fetal circulation. It has been demonstrated experimentally, that in rabbits the streptococcus may go through the placenta and reach the fetal circulation. This is especially possible when the placenta is not quite normal and when the uterus is affected with a certain degree of metritis.

*Second, through the Lymphatic Channels.*—This mode of invasion is especially common in infections localized in the vicinity of the peritoneal cavity, such as erysipelas of the abdominal wall, infection of the pleural cavity, etc. The peritoneum is spoken of as a large lymphatic sac, which has a wonderful capacity for rapid absorption. The lymphatic vessels are especially developed on the diaphragmatic part of the peritoneum, and the intimate lymphatic communications between the peritoneum and the pleural cavity are exceedingly numerous. Therefore it is not infrequent to find an infection of one cavity developed secondarily to the infection of the other.

*Third, the Uterovaginal Infection.*—Infection of the peritoneum may take place through the vagina and the uterus, without leaving any pathological signs in these organs. This mode of infection may be exceedingly rare, but there are a few cases in the literature which seem to be convincing.

Meunier reports the case of a young girl, sixteen years old, who had never been sick before. At the time of her menstruation, she used a napkin which was previously used on the face of a patient with erysipelas. Two days after, she was taken acutely ill and died three days after of an acute general peritonitis. Every abdominal organ was found normal at the autopsy. Bacteriological examination showed a pure culture of streptococ-

cus. A postmortem disclosed that this young girl was a virgin and that the genital apparatus was normal.

Tarnier reports two cases of nurses taking care of puerperal infections while menstruating; they were both taken suddenly ill and one died in a few days of a general acute peritonitis; the other recovered after a long illness. In the first case, no cause for general peritonitis was found and bacteriological examination showed a pure culture of streptococcus. The uterus and genital organs were absolutely normal,—the young girl was a virgin.

How does such infection reach the peritoneum? Is it through the lymphatics, or through the uterus and tubes? This problem is difficult to solve, but very likely, the infection takes place through the lymphatics, as in puerperal sepsis. Bumm has demonstrated in such cases the presence of streptococci in the lymphatic vessels, when none could be found in the uterus and tubes, so that it can be reasonably concluded, that during menstruation, the uterovaginal tract being more susceptible to infection than at any other time, virulent microorganisms may, in very rare cases, rapidly reach the peritoneum and cause an idiopathic peritonitis.

*Fourth.*—Some authors seem to think, that in certain cases of idiopathic peritonitis, the organism causing the peritonitis comes from the intestinal tract.

H. P. Hawkins (*St. Thomas' Hospital Reports*, 1892) has found microscopical abscesses in walls of appendices that appeared normal to the naked eye. He believes that the appendix is responsible for some cases of idiopathic peritonitis, and that the most plausible theory to explain idiopathic peritonitis is that the microorganisms pass through the intestinal wall without producing any observable lesions in the peritoneum.

Reymond (*Annales des Maladies des Organes Genitourinaires*, April, 1893) has shown that in dogs the urobacillus liquifaciens of Krogus is not only capable of penetrating the bladder wall, but can also pass through the intact peritoneum without producing any microscopical lesion.

Every case of idiopathic peritonitis found in the literature has been caused by the streptococcus or the pneumococcus. There is no case of primary peritonitis due to the colon bacilli.

Primary streptococcic peritonitis and primary pneumococcic peritonitis are found oftener in the female sex than in the male, but the streptococcic variety mostly affects adults, the pneu-

mococcic mostly children, between three and twelve years of age. Girls are more subject to it than boys. The anatomopathological lesions are different in both varieties.

In pneumococcic peritonitis the pus has a great tendency to become encapsulated, forming more or less numerous purulent loges. The adhesions are extremely thick and form pseudomembranes. Peritonitis is very seldom general and diffuse. The pus is greenish, thick, homogeneous, laudable and odorless.

In streptococcic peritonitis, there is no such tendency to encapsulation. The peritonitis is from the start diffuse and general. There is very little or no formation of adhesions and fibrinous membranes. The pus, has a dirty and sanious aspect.

In both varieties of peritonitis, the beginning of the disease seems to be more or less the same. In perfect health, or seemingly so, patient is taken with an intense sharp pain in the abdomen, comparable to the pain in the side of pneumonia. This pain, as a rule, is not localized in a special part of the abdomen. In a few cases, however, such as mine, it has been localized in the right iliac fossa, and the mistake in the diagnosis is readily understood. That the patient is taken sick with acute appendicitis, is the first idea, which will come to the attending physician.

In both forms of peritonitis the onset is very sudden. The only difference between the two varieties is, that the pneumococcic peritonitis is fulminating from the beginning, and absolutely without any prodromal symptoms. It comes like a thunder bolt from a clear sky. In the streptococcic peritonitis, although the patient stricken is seemingly in good health, he has had tonsillitis or a furuncle a few days before, in the majority of cases at least. In both varieties, the vomiting and the diarrhea are among the first and most constant symptoms. Vomiting is incessant. Constipation is looked upon more or less as the rule in peritonitis. This is true, no doubt, in the great majority of cases of peritonitis secondary to appendicitis or perforation of an abdominal organ, but it is not true for streptococcic or pneumococcic, primary peritonitis. The diarrhea appears as one of the earliest symptoms and has never been missed in any of the reported cases. It was so marked in a few cases, that the diagnosis of intestinal tuberculosis or typhoid fever has been made.

Temperature in both varieties of peritonitis is very high from the beginning. My case is an exception to this rule. Both forms of primary peritonitis may be said to begin suddenly with an intense, diffuse pain in the abdomen, vomiting, diarrhea

and high fever. When one finds this syndrom, as a beginning of an abdominal disease, the possibility of a primary general peritonitis should be very seriously considered. The diffuse pain in the abdomen and the diarrhea, with high fever and intense and constant vomiting, are sufficient to differentiate this form of peritonitis from that due to appendicitis.

Prognosis in both varieties is altogether different. In primary pneumococcic peritonitis, the symptoms remain the same for a few days; the fever is high, vomiting and diarrhea are constant and pain remains localized in the abdomen; after four, five or six days of the disease, the abdomen becomes distended and, in a few cases, the course of the disease resembles that of typhoid fever; but the Widal test is negative. Eight or ten days after the beginning of the disease, the fever subsides, sometimes very abruptly, sometimes gradually. The abdomen still remains distended and a dullness, with evidence of fluid, is found in the iliac fossa, on one or both sides, and very frequently in the umbilical region. In some cases, this condition has been mistaken for a tuberculous peritonitis. In half of the reported cases of primary pneumococcic peritonitis, perforation has taken place spontaneously in the umbilicus, forming a real peritoneal vomica, which resembles in every respect the vomica found in empyema. The course of the disease is a long one, lasting for weeks, and recovery is extremely frequent.

In streptococcic peritonitis, the general symptoms are very much more marked. The patient is exceedingly prostrated from the start, the pulse is very much accelerated and of small volume. The patient soon becomes delirious and manifests a tendency to collapse. In two, three or four days, the patient is dead. Very rare are the cases of primary streptococcic peritonitis which have recovered spontaneously or by surgical treatment.

It appears therefore that the prognosis of streptococcic peritonitis is very much more serious than pneumococcic peritonitis. In the latter, the infection of the peritoneum may remain localized in this serous membrane for a long time before affecting the general condition of the patient. In streptococcic peritonitis, the poisoning of the organism is exceedingly rapid and intense and terminates in a few days in death. Correct diagnosis is possible in a great many instances by carefully giving each symptom its value.

In appendicitis, the abdominal pain is less diffuse and is very promptly localized in the right iliac fossa, in the region of

McBurney's point. The peritonitis due to appendicitis is not so acute in its development as the streptococcic and the general symptoms, the delirium and the tendency to collapse are very much less marked in appendicular than in the streptococcic variety.

As a rule, appendicitis is not accompanied by diarrhea, neither is perforation of a duodenal or gastric ulcer. The pain from perforating ulcers is exceedingly sharp, so sharp that the patient is on the verge of unconsciousness, and is referred to by the patient as a stabbing sensation in the upper part of the abdomen or in the epigastric region. In primary streptococcic, or pneumococcic peritonitis, the pain is diffused all over the abdomen, without a special point of localization. Treatment is, in every case, surgical and its success depends upon an early diagnosis.

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 151 E. BROAD STREET.



THE OPERATIVE TREATMENT OF PUERPERAL SEPTICEMIA.<sup>1</sup>

BY

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It is probable that puerperal infection has occurred as long as children have been born. While great advances have been made in our knowledge of it and its treatment, there are yet many problems which are not entirely settled and about which there is a difference of opinion among authorities of equal rank. The high mortality which attends its severe forms has induced many efforts to save life by operative measures. It is difficult to lay down positive rules for guidance and exceptionally good judgment and wide experience may be required to make the right decision. Problems are presented to the surgeon in the consideration of this condition which require that he must know when to withhold the knife as well as when to employ it for the relief of the patient.

There are some forms of infection in which it may be advisable to explore the uterus to ascertain its condition. If the abdominal examination has shown an organ with delayed involution and tenderness and if the lochia is beginning to be foul, this would suggest the retention of blood coagula or the products of conception. If an exploration is to be made it should be done early and only under the strictest antiseptic precautions. The vulva and the vaginal walls, as well as the hands, should be thoroughly disinfected. Anesthesia is usually necessary in order to make a thorough exploration of the uterus. The entire cavity of the uterus can thus be investigated by the finger which should be gloved. Under normal conditions the surface of the uterus should feel smooth except at the site of the attachment of the placenta. This can be identified as a roughened and irregular area projecting slightly above the surface. If there is placenta present it may be recognized as a mass projecting into the uterine cavity and may be separated by using the finger as a curet.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

After all loose fragments have been thus separated and removed the surface of the uterus may be gently rubbed with cotton wool on an applicator or swabbed with tincture of iodine.

The curet should be reserved only for those cases in which the retained products cannot be effectually removed by the finger or douche. There is no doubt that it is sometimes useful in skilled hands in emptying the uterus, but its dangers are so great that in the hands of the average practitioner it should rarely, if at all, be used in the puerperal uterus. In spite of the repeated warnings of those most experienced in its use, who use it with fear and hesitation, every tyro is confident that he can employ it with boldness and skill and hesitates not "to rush in where angels fear to tread." It is a significant fact that nearly all those very serious cases which come into the hospital in a critical condition, give a history of having been cureted one or more times by the attendant. The curet must in any puerperal case be used with the greatest skill and judgment. If the lochia is scanty or purulent and evidence of retained products is not present, then the operation is contraindicated. If the uterine cavity presents a smooth surface as it does in many cases of severe streptococcic infection, then a curetment is probably the very worst thing that can be done as far as the patient is concerned and it should be absolutely forbidden. It is in these cases that the most harm will be done by its use and the result may, and oftentimes does, prove fatal to the patient. It is not to be denied that in some cases where fever follows delivery there is a prompt subsidence of the symptoms following curetment, but these cases are most always cases of sapremia and would terminate favorably spontaneously, or under other treatment.

The time for action is on the first rise of temperature after delivery. A thorough examination externally and internally of the pelvic organs should be made. If it is determined that the uterus is not entirely emptied and all clots, decidua and débris cannot be removed by the finger, then a large broad curet such as that used by B. C. Hirst may be gently passed over the surface of the uterus with just enough force to dislodge scraps of retained products. Such a curet will remove the débris effectively without injuring the mucosa. The ordinary sharp Sims' curet should never be used under any circumstances in the purperal uterus.

Whatever manipulation is adopted should be done in the very beginning of the trouble. After infective organisms have penetrated the body of the uterus or have spread to the lymphatics,

or if general infection has taken place then any local treatment by cureting is as useless as trying to remove sand from the beach by sweeping it up and is often productive of the greatest harm to the patient.

An important distinction must be made, however, between infection occurring as a result of abortion in the early months of pregnancy and infection after labor at, or near full term. After abortion in the early months the results of curetment are almost invariably favorable if done at once, whereas after labor at or near the full term it becomes a very dangerous instrument. It is more injurious than useful, and instead of being used indiscriminately by everybody should be reserved as almost a last resort and used only after most mature deliberation.

Suppuration in the pelvis may be the result of inflammation of the pelvic cellular tissues after childbirth, or may arise from peritoneal infection either with or without the formation of pus in the appendages. The attempts which have been made to cut short the course of a pelvic cellulitis by early free incision and drainage have not given very satisfactory results. It must not be forgotten that in the absence of pus formation, large masses of exudate may be absorbed. It is therefore to my mind inadvisable to undertake any operative procedures unless there is definite evidence of the formation of pus. If there are the clinical symptoms of pus formation and the abscess forms in the upper part of the broad ligament an incision may be made in the abdominal wall parallel to Poupart's ligament. The abscess may in this way be evacuated without entering the peritoneal cavity. If the abscess, however, fills the most dependent part of the pelvic cavity, namely, the pouch of Douglass, then an incision through the posterior vaginal wall may be made and the pus readily evacuated.

The formation of pyosalpinx in the course of puerperal infection is rare. If it exists it is usually the result of a preexisting gonorrhea. An infected tube, however, may have existed before the pregnancy occurred. I have frequently observed a run of temperature, an elevated pulse, and other symptoms of puerperal infection, which were due to an old pus tube. The onset of labor in these cases has seemed to light up an old fire which had been smouldering in a chronic or subacute stage.

The extension of the infective process from a puerperal uterus usually follows the line of the lymphatics producing abscess in the ovary or the pelvic cellular tissue. The pus in cases occurring in

this way after delivery is of a very virulent type and if peritonitis of a diffuse kind takes place it is rapidly fatal. To attempt therefore to remove appendages thus infected through an abdominal incision is to invite grave risk of setting up a diffuse peritonitis. If the infection happens to be from the streptococcus the danger is particularly great. The wisest course therefore if the presence of pus in the pelvis is detected after childbirth is to perform a posterior colpotomy and drain the pus from below. In those subacute cases in which there is no immediate danger to life, experience has taught that the avoidance of all operative treatment is the best course to pursue, until the virulence of the pus is attenuated and the acute stage has passed off. Then treatment should be instituted by abdominal section if the appendages are infected, or by posterior colpotomy in the case of a pelvic abscess.

Puerperal peritonitis is a dangerous complication and the mortality has always been high. The adoption of surgical procedures in the last few years has been attended with quite a degree of success, but there is no question connected with childbirth which demands more careful judgment than the question of surgery in some forms of puerperal peritonitis. It is not probable that the results will ever be so favorable as those obtained from peritonitis due to some local lesion such as appendicitis, perforating ulcers of the stomach, intestine, gall-bladder, etc. This is true because it is rarely possible to completely remove the cause of the infection as is done in these cases.

The flat-bellied peritonitis due to a severe and virulent streptococcic infection in which there is no peritoneal reaction, is dreaded by every surgeon. There may be subnormal temperature, cold leaky skin, no pain, or very little and the coils of intestine are found to be united by a fibrinous or purulent lymph. Death always ensues in these cases which may last three or four days. They are quite beyond surgical or any other kind of treatment, and seem to be overwhelmed from the beginning with the toxemia.

If the peritoneal infection is limited to the pelvis then posterior vaginal section should be done promptly and thus check its spread. This is especially valuable in the early stage of lymphatic peritonitis spreading from the uterus and broad ligaments. It should never be done in the diffuse forms of peritonitis because it is entirely too inadequate to meet the grave conditions present.

Great difficulty may be presented in the early diagnosis of

general puerperal peritonitis. If an operation is to be done at all it should be done early if a favorable outcome is to be gained. If we wait until the disease has fully developed valuable time will be lost and the operation may be undertaken too late to save life. On the other hand we know that many cases which look very bad at first subside spontaneously and the symptoms clear up. It is manifestly unjustifiable therefore to open the abdomen of every patient on the first appearance of symptoms of peritonitis. Wide experience and good judgment are, therefore, the only rules for guidance under such circumstances.

Very frequently the symptoms of peritonitis develop gradually, and a variable amount of seropurulent fluid is poured out. These are usually the less virulent cases, and abdominal section followed by the Murphy drip and the Fowler position saves many lives. In some instances localized collections of pus occur, being especially liable to form around the appendages in the pouch of Douglass, or in the iliac fossa. The results obtained here by incision and drainage are good.

In diffuse peritonitis abdominal section is the operation of choice, for it has the advantage of permitting a complete exploration of the whole abdominal cavity. Sometimes unexpected conditions may be discovered as the cause of the infection which had hitherto escaped detection, such as ruptured appendix, tumor of the uterus, or diseases of the appendages. Drainage should preferably be through the vaginal vault, though in some cases it may be through the incision of a stab wound. The best results will be obtained by a simple irrigation with normal salt solution at a temperature of 100° F., avoiding as far as possible any handling or manipulation of the tissues, and not attempting to detach flakes of lymph as was formerly done, for these are a part of nature's own protective.

*Thrombophlebitis.*—The remarkable success obtained in the treatment of aural pyemia by ligature and excision of the jugular vein has stimulated attempts to carry out similar modes of treatment in pelvic thrombophlebitis. Trendelenburg, in 1902 removed septic thrombosed veins for the relief of puerperal infection. Successful operations of this kind have also been reported by Williams, Freund, Bumm, Vineberg, Seligman, Huggins, and Miller of New Orleans.

The diagnosis of thrombophlebitis is not attended with particular difficulty. Repeated rigors form a characteristic feature in almost all cases, though occasionally they may be absent.

Trendelenburg, Bucura and others advise operation after the third or fourth rigor. Lea thinks this a little early in view of the fact that about 40 per cent. of the cases get well spontaneously. The mortality is high. Forty cases including five of his own were analyzed by J. Whitridge Williams showing a mortality of 43.9 per cent. The best results have been obtained in the subacute or chronic cases operated upon four to six weeks after delivery. There is little doubt that a considerable number of such cases would get well without any operation. It is not possible up to the present time to formulate precise indications for the operation, and owing to its gravity it is not probable that it will be adopted by the profession generally.

Hirst says: "If abdominal section is done because thrombophlebitis is suspected, many an unnecessary operation will be done. I have rarely indeed seen a condition of the ovarian veins that called for their ligation or removal. Thrombophlebitis as the sole cause of an operation and as the only thing to be removed is not demonstrated yet to the majority of surgeons." Polak believes that thrombophlebitis is a conservative process on the part of nature to limit infection, and that any form of pelvic manipulation only tends to break down and separate these thrombi, extending the infection to the remote parts, thus jeopardizing the patient's life.

*Hysterectomy.*—The question of the removal of the uterus as a mode of treatment in certain cases of puerperal infection is one that is attended with some difficulty. If there have been extensive injuries to the uterus, such as a rupture or perforation, or if there is an infected tumor, such as myoma, or if an abscess of the uterine wall can be demonstrated, the operation is clearly indicated. If on the other hand the operation is performed simply in the hope that a fatal result from septicemia may be averted, it is very much open to question. It is difficult or impossible to recognize the moment when it can be said that the infection is confined to the uterus, and if it has gone farther than the uterus the operation cannot remove the infection. If the operation is delayed until the infection is established it may be too late and will only precipitate the fatal issue. If done early we subject the patient to the risks of a grave operation when in many cases she would have recovered spontaneously anyhow. There is the further danger of conveying infection to the peritoneal cavity, or of opening up fresh lymphatic spaces, and the fresh wound surfaces may readily become a source of renewed



infection. The mortality where hysterectomy has been done in puerperal cases has reached 70 per cent. This is considerably higher than the death rate from puerperal infection of severe types treated without operation.

Vaginal hysterectomy has been championed as being less liable to general infection and accompanied with less shock. This, however, has obvious disadvantages. The enlarged uterus is friable and more subject to lacerations. On account of the infiltration of the broad ligaments the danger from hemorrhage is greater and it is harder to make a thorough exploration of the pelvic and abdominal cavities. It may be of use sometimes in cases of septic abortions or the later stages of the puerperium, but the method on account of its difficulties and disadvantages has largely been given up.

## REACTION IN THOSE OPERATED UPON FOR TUBERCULOUS CONDITIONS.<sup>1</sup>

BY

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THIS paper is rather in the form of a preliminary study of the reaction of those operated upon for tuberculous lesions. For the sake of conciseness, and because already much has been written upon the dissemination of tubercle bacilli and the production of a miliary tuberculosis, this phase of the subject is omitted.

Many authors, among them Bruno Wahllander(1), Döderlein and Kronig(2), Zweifel(3), and A. Mayer(4), have written upon the subject of operation in tuberculous subjects and have spoken of the danger of an exacerbation and the production of general miliary processes. Such is especially to be feared where there is a second more or less active process in the body, and particularly in those running a temperature at the time of operation. F. Weil(5) reports a case of miliary tuberculosis complicating abortion. All of these have considered the subject from the standpoint of a dissemination of the tuberculous process, and have taken no notice of reactions which resemble in all particulars that which follows the injection of tuberculin in a tuberculous subject.

Some time ago I was struck by the decided temperature

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

reaction in a patient operated upon for tuberculous salpingitis, in whom the wound healed by first intention and in whom there were no other untoward symptoms. Shortly after this a similar condition was observed in a patient from whom I removed a tuberculous kidney. After these experiences we began to expect such reactions in certain of our tuberculous patients, and have been able to predict them at the time of operation. The reactions referred to have been characterized by a rise of temperature of from two to four degrees after twelve hours, often followed by another rise in the next twenty-four hours; a rise in the pulse rate; general bodyache and a feeling of malaise; sometimes marked headache; often an exacerbation of other local tuberculous lesions, or of quiescent ones. These reactions are in all respects similar to those described by Sahli(6) in his latest book, as due to an overdose of tuberculin. The length of time the temperature has lasted has depended greatly upon the severity of the reaction in other local lesions. In some of our cases it has been for only a day or two, but in others it has lasted longer.

After observing some of these cases it occurred to me that this condition was due to the liberation during operation of a certain amount of tuberculous material into the circulation, and that we were producing a severe tuberculin reaction. In the instance in which there is a concomitant pulmonary lesion it is impossible to say how much of the reaction is due to local disturbance by the anesthetic and how much to the tuberculous focus.

Naegli(7) and Burkhardt(8) in their study of a large amount of autopsy material came to the conclusion that nearly every adult showed some tuberculous lesion in the lungs, active or healed, clinically as well as anatomically. Many of these had failed during life to give any symptoms referable to the lungs. Hamburger(9) is of the opinion that many of the cases of pulmonary tuberculosis giving active symptoms are due to the exacerbation of a long-standing latent pulmonary process, which activation was produced by the lowering of the patient's resistance or by the augmentation of the tuberculous predisposition. Kaufman(10) states that one-third to one-half of all bodies coming to autopsy in Germany show tuberculous lesions. Paul Thiery(11) is of the opinion that tuberculous processes are seldom confined to one organ.

The high percentage of von Pirquet reactions speaks for the fact that most of us have at some time or other been infected with tuberculosis.

While tuberculous lesions may be manifest only in the peritoneum, Fallopian tubes, uterus, kidneys, etc., it is generally thought that these are secondary to lesions of the lungs or the bronchial lymph glands.

Many of these tuberculous lesions may be reactivated by a number of different conditions, *e.g.*, disturbance of a local focus by operation; overexercise, as is often seen by the rise of temperature in pulmonary conditions following too much physical effort. This is one of the reasons that patients, especially those running a temperature, are kept quiet. On the other hand, in afebrile subjects, Patterson has taken advantage of this and, by moderate graduated exercises, has made his patients produce sufficient reaction (and tuberculin) to treat themselves with selfmanufactured tuberculin. It is thought that the temperature at the menstrual period in those suffering from tuberculous conditions of the uterus and tubes is brought about by the increased congestion of the catamenial epoch. Again, local conditions are made more active by a lowering of the body resistance, as is often seen in old people with tumor cachexia and chronic diseases(12). In just what way pregnancy causes an exacerbation of tuberculous conditions is not known, but it is generally conceded to be distinctly harmful.

Zweifel(13), in speaking of the results of operations upon tuberculous tubes and for tuberculous peritonitis reports four fatalities in sixty cases. In one of these, operated upon for what was thought to be tuberculous peritonitis, no tuberculous process was found in the abdominal cavity, yet the patient died of an exacerbation of the lung condition. One died from tuberculous meningitis. While he does not speak of the reaction as one due to the liberation of toxins, or attempt to explain why these patients died, he warns against operations for tuberculous peritonitis if there are other discoverable tuberculous lesions in the body. This account is the nearest that I have found to the idea which prompted this study.

Döderlein and Kronig(2), treating the subject of tuberculous peritonitis, warn against operating such patients when there is an active tuberculous process elsewhere in the body, especially pulmonary lesions. They fear the production of miliary tuberculosis.

Kelly and Noble(14), in their treatment of the subject of tuberculous peritonitis, speak of the time the postoperative temperature took to return from the high point to normal in

drained and undrained cases, but lay no emphasis on the fact that there was a postoperative temperature reaction, nor offer any suggestion as to the cause.

Wahllander(1), in his inaugural dissertation many years ago, treated the subject of the dissemination of tuberculosis by operation. He spoke of the relative immunity from such a spread in those operated upon for tuberculous glands of the neck, explaining this as due to the fact that the processes are, as a rule, rather inactive and completely walled off.

I am of the opinion that many of these cases reported are not an actual dissemination of tuberculous material with the production of miliary tuberculosis, but that the condition is due to the reactivation of other tuberculous processes by the tuberculin liberated in the disturbance of the operated lesion.

For the production of this reaction the disturbance of a more or less active focus, and the presence of another focus, seem necessary. Where there is a pulmonary lesion it is difficult to say just how much of the reaction is due to the effect of the anesthetic.

#### ILLUSTRATIVE CASES.

*Tuberculous Peritonitis.*—Of seventeen cases from the Babies' Wards of the Post-Graduate Hospital (Services of Dr. Samuel Lloyd and Dr. Theodore Dunham), six showed more or less temperature before operation and are therefore unsuitable as illustrating the point under consideration. Of these six, however, it may be mentioned that following operation five died and only one was improved. This is very much in accordance with the experience as detailed by most authors.

Of the eleven with no temperature before operation, eight showed a rise of temperature of from two and a half to five degrees after operation, this rise taking place after from twelve to eighteen hours, and lasting from twenty-four to seventy-two hours (in two the temperature lasted four and five days). Three had no reaction. Ten were improved or cured, and only one died.

No mention is made of pulmonary lesions in any of these cases.

The following cases, unless otherwise credited to, are from my own experience.

CASE I. *Tuberculous Salpingitis.*—M. A., æt. nineteen. Family history negative. Married five months, never pregnant. Menses at sixteen, every four weeks, associated with marked pain

during flow. Rather profuse. The last period was June 1, three days and profuse (this history taken July 10, 1912). Since marriage has had constant pain in the left adnexal region, worse at the menstrual periods. General health fairly good, though patient appears frail. Dulness and harsh breathing, both apices. Transverse section. Left side, densely adherent tube, size of hen's egg, filled with caseous material, removed. On right, the tube was the size of lead pencil, more or less coiled up and adherent to the broad ligament and cornu of uterus. Removed. Temperature on day of admission was 99.6, just before operation, 97.8. Operation at 9 A. M. That night at 8, temperature was 100.6, the next morning at 8, 102.5, the night of the first day after operation, 104. Second day after operation, in the morning, 100.6, at 4 P. M., 105.6, at 8 P. M., 102. After this there was a gradual fall to normal on the ninth day. The second day after operation there began cough that was troublesome for four days. Patient left the hospital on the fourteenth day in good condition, with a wound that had healed by primary union.

*Remarks.*—Rather sharp febrile reaction with exacerbation of pulmonary condition.

CASE II. *Tuberculous Right Kidney and Right Epididymis.*—From the service of Dr. John Pirelli. A. A., aged thirty-two. Italian, male. Lungs show dulness and harsh breathing both apices. Right kidney and right testicle removed, on account of tuberculosis, on the afternoon of July 11, 1912. The next day the temperature rose to 101, and on the second to 103.6. Gradual fall to 100.2 on July 22, when these notes were taken.

CASE III. *Tuberculous Kidney.*—Mrs. M. F. C., aged fifty-two. Operation March 3, 1909. This patient had had severe cystitis for two years. Tubercle bacilli were found in the urine. At the time she was seen she was very thin and emaciated; previously very robust. Urine containing pus and tubercle bacilli obtained from the right kidney. That from the left showed no pus; tubercle bacilli were found by guinea-pig inoculation. It was thought that this might be accidental. Bladder showed severe cystitis, most marked around right ureter. Right lumbar nephrectomy.

The temperature before operation ran from 98.4 to 100. In twenty-four hours after operation it rose to 101, and remained near this until March 9, when it assumed a septic type, 97.8 to 102-103. This continued to March 22, on which day, and on the 23rd and 24th, it remained normal. On the 25th it again assumed the septic type, 97 to 102, and remained so until the patient left the hospital. The wound healed by primary intention, but the cystitis became markedly aggravated. This did not improve after operation; in fact it became worse, and the patient died, one and a half years after operation, from suppression of urine. This was possibly due to the fact that the

second kidney was involved at the time of operation, or became so subsequently from an extension from the bladder.

*Remarks.*—Here we have a reaction that is not quite so marked as some of the others, and an exacerbation of the cystitis.

CASE IV. *Tuberculous Kidney.*—Mrs. D., aged twenty-eight. Admitted to hospital (private service) on August 14, 1911. In 1908 this patient caught cold and then had an attack of frequency of urination, with burning micturition. In the previous spring had had some dull pain in the region of the right kidney. Since then has had frequency of urination, and dull pain in right renal region. On three occasions the pain has been in the form of sharp attacks lasting a few hours. Cloudy urine noticed from the beginning of symptoms.

Cystoscopy shows normal-appearing bladder. Urine from the right kidney contains moderate amount of pus, and shows numerous tubercle bacilli. That from left clear, and no tubercle bacilli found.

Physical examination of the chest shows a few moist râles just below the angle of the left scapula; occasionally one on right side in similar position.

August 15, right nephrectomy. The tuberculous process was confined to the upper pole and pelvis of the kidney. Ureter only slightly thickened. The operation was at 9 A. M. and the temperature before operation was 98. At 2 A. M. the next day the temperature was 101.4, and at 4 P. M. had risen to 104.6. Headache and pain in the left side of the chest were marked. From August 17 to 22 temperature ran from 101 to 103, after which there was a gradual fall to 99.4 on September 19. The wound broke down, and the patient had a tuberculous fistula up to the time she went abroad one year after operation. The bladder irritability cleared up completely, and the urine showed nothing abnormal.

*Remarks.*—Here we had a sharp reaction, with an exacerbation of the pulmonary lesion.

CASE V. *Tuberculous Tubes.*—Mrs. A., aged twenty-three. July 5, 1911, operation. This patient had had two children. Menstruation was regular until shortly before she came under observation. She should have menstruated on February 26, but was delayed until March 3, when a nine days' flow started, moderate in amount. Did not menstruate again until June 4, when a slight flow started that persisted as such until July 1, since which time it has been profuse.

Operation for tuberculous tubes, which were of the size of the adult male first finger, and filled with caseous material. No tubercles seen on the peritoneum.

The temperature before operation ranged from 99 to 100.

Operation was at 9 A. M., and on the next day at eight in the morning the temperature was 104.6. There was a gradual fall



to 100 on the ninth day. Headache first few days, and troublesome cough on the third and fourth, though nothing was found on physical examination of the chest before or after operation. Von Pirquet positive. Wound healed by primary intention; patient has been seen since operation and feels well.

*Remarks.*—Here we had a marked temperature reaction. The cough was in all probability due to the action of the tuberculous products thrown into the circulation on a pulmonary lesion that escaped notice.

CASE VI. *Tuberculous Kidney.*—Mrs. W. E. B., aged twenty-eight. Seen first in June, 1911. Eight years before caught cold and had a severe attack of cystitis that lasted two months, since which time there has been marked frequency of urination. In the fall of 1908 had brisk hematuria for two days, which was called vicarious menstruation. In the Fall of 1909 general health was poor and she had a break down; at this time pus, albumin, hyalin, and finely granular casts were found in the urine. Was then voiding every one to two hours. From January, 1910, to the spring of 1911, felt fairly well, but since then has been losing weight, and the frequency of urination has become more marked. In June, 1911, she was voiding every five minutes to one hour by day and getting up nights from five to twenty times. Tubercle bacilli in bladder urine.

Cystoscopy showed severe cystitis, most marked in the region of right ureter. Left ureter catheterized and urine free of pus and tubercle bacilli obtained. Right ureter could be felt as thickened cord through the vagina.

Slight cough for long time. Physical examination of chest negative. Normal temperature.

In June, 1911, right nephrectomy. All except a very small portion of the lower pole of the kidney destroyed by tuberculous process. The wound healed by primary union, though two months later a small sinus formed that persisted for six months.

Temperature before operation, which was 9 A. M., June 26, 98.6; June 26, midnight, 102.4; June 27, 4 P. M., 103.6; June 28, 4 P. M., 102.8; June 29, 4 P. M., 102.8; June 30, 4 P. M., 101.6, and from that time a gradual fall to 100 on July 4. During the reaction the headache was marked and the existing cystitis much aggravated.

*Remarks.*—The postoperative reaction is similar to what we would have expected after tuberculin; brisk temperature rise, with an aggravation of the tuberculous processes, in this case the cystitis.

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## APPENDICITIS DURING PREGNANCY, WITH THE REPORT OF AN INTERESTING CASE.<sup>1</sup>

BY  
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(With Four Illustrations.)

It is not the purpose of this paper to give an exhaustive review of the literature, which has come into existence in the last few years on the subject of appendicitis occurring during pregnancy.

Neither is it thought advisable to discuss the question after the style of a monograph or text-book article because much that would have to be said has already been printed and would therefore be tedious.

The object is merely to discuss some phases which have been brought up by the case which will be reported later and illustrated by the accompanying diagrams.

Since Munde's case (1894) there have been many instances recorded where the pregnant woman has developed appendicitis, been operated and recovered.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

Bandler's table in the *Jour. A. M. A.*, Oct. 17, 1908, shows all the cases of perforative appendicitis reported up to that time and gives the period of uterogestation at which the attack developed, whether or not there had been previous attacks, whether operation was performed, the condition of the appendix and amount of peritonitis, whether abortion occurred and if so at what time in relation to operation, and also the infant and maternal mortality.

These cases numbered 103, while the total number of all varieties of appendicitis which were reported as complicating pregnancy, labor or the puerperium is 235, which seems to show a marked tendency to the perforative form among such women. However, it is probably true that this is not a sure index of the real condition on account of the ease with which mild attacks may be overlooked by both patient and physician. This is illustrated in my case with the exception that the pathology produced may not with propriety be termed *mild*, although clinically it certainly was mild, or at least was so considered by the patient because she did not go to bed or consult a physician.

Since Bandler's report in October, 1908, there have been quite a number of such cases reported, notably those in the article by Palmer Findley, in the *AMER. JOUR. OBST.*, December, 1909, who cites seven instances with three deaths which arose in his practice within eighteen months.

Cooke (*N. Y. Med. Jour.*, May 1, 1909) says that appendicitis should be suspected in all cases of right-sided pain occurring during pregnancy.

It is fair to presume that all cases of appendicitis occurring during pregnancy have not been recognized and that many of those which have been recognized have not been reported and that therefore the condition is much more common than a review of the literature on the subject would lead one to suppose.

The etiology of the disease during pregnancy is the same as in the nonpregnant state. Pregnancy is not an etiological factor save in those who have had previous attacks.

The pathology is only changed by the presence of the enlarged uterus. After the disease has spent its force, however, and recovery ensues, there are some new questions which arise. In those cases accompanied by peritonitis, occurring in the latter half of uterogestation, the effect of labor on possible adhesions or abscess must be considered.

Kelly and Hurdon, (p. 730), quote Muret's case where in the

fifth or sixth month of pregnancy a typical appendicitis developed but soon subsided with a disappearance of all symptoms. The pregnancy went on to term and a normal delivery followed, but two days later the patient died from perforative peritonitis. Autopsy showed that the contractions of the uterus had caused rupture of an abscess.

Through the courtesy of my colleague, Dr. H. A. Duemling, it was my privilege to see and assist in the operation for appendicitis upon a woman six months advanced in uterogestation. The appendix was gangrenous. It was removed and a large gauze drain inserted, which was withdrawn in due time and the woman recovered and went to term. The case occasioned much discussion between us as to the pathology present, the effect of labor on the adhesions and the proper treatment when contractions came on. It was certain that the adhesions were quite strong and therefore one of two things must happen. Either the uterus must pull itself loose or labor must be terminated by the forceps on account of the adhesions holding the fundus so high that the organ could not empty itself. In event the former proved true, we were afraid of hemorrhage into the peritoneal cavity, and if the latter obtained, we were afraid of hemorrhage from the placental site, so we decided to open the abdomen upon the advent of labor and ligate the adhesions before cutting them. This we did, and while we found plenty of them present, they were not so numerous and formidable as we had anticipated. This led us to speculate upon the possibility of the uterus freeing itself and whether the hemorrhage would have been alarming in case it had done so. The wonderful resourcefulness of nature in removing peritoneal adhesions was here exemplified. While the abdomen was open the labor was terminated by Cesarean section. This patient has since been confined in the normal way.

There seems to be some difference of opinion about the ease with which a diagnosis may be made. Thus Bandler says, "the diagnosis is not as a rule difficult," while Cooke maintains that "the diagnosis is not easy." In those cases which I have seen in the early months of pregnancy the diagnosis offered no unusual difficulties. In the later months one is only confused by the changed relations. He must eliminate nephrolithiasis and pyelitis in the one as well as in the other. The location of the pain, tenderness and rigidity, seems higher and nearer the back when the uterus is large.

Aside from the change in the location of the point of greatest

tenderness there is no variation in the symptoms of appendicitis produced by pregnancy. Abdominal pain, vomiting, fever, increased pulse rate, etc., together with the objective findings make up the usual picture.

There is general concurrence in the matter of treatment. All writers advise early operation in spite of pregnancy. Should labor supervene in the presence of an abscess, this should be evacuated before emptying the uterus to prevent disseminating the infection. In other cases the belly may be opened im-

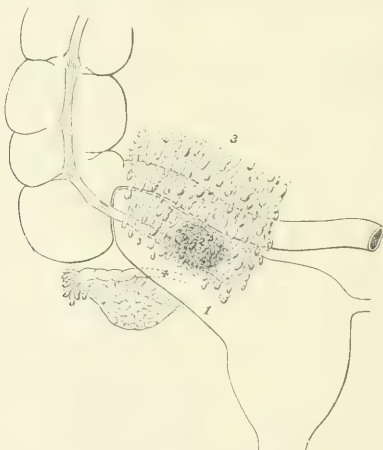


FIG. 1.—1. Uterine diverticulum. 2. Abscess. 3. Omentum. 4. Tube behind diverticulum.

mediately upon the completion of labor, if this has been started by the appendicitis, as not infrequently happens. Many cases are operated, however, without interrupting the pregnancy.

The case which has called up these thoughts anew occurred in the person of Mrs. R., twenty-three years of age, a resident of Antwerp, O., and referred by Dr. G. M. Brattain. She is the mother of two children, one nearly three years of age and the other born October 20, 1911. Her first pregnancy was normal in every way. In fact, her whole history is negative. She denies ever having had any kind of abdominal or pelvic pain whatever prior to the attack she suffered about the sixth month

of her last pregnancy. This she did not consider important enough to consult a doctor about. The pain was rather severe for one day but did not confine her to bed. It was much better the second day and gradually left on the third. She had no further pain until contractions started. The labor was of short duration (two to three hours) and the placenta was expressed, considerable force being used. She did not lose a very unusual amount of blood. On the second day of her puerperium she had a rather severe chill followed by a high fever which continued

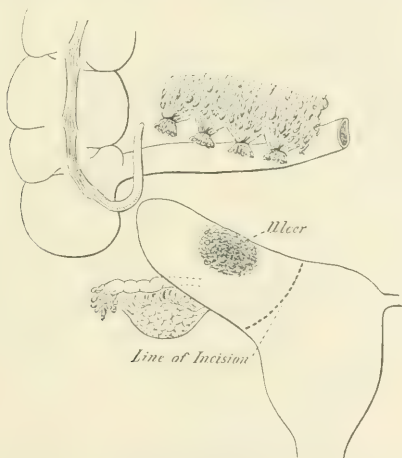


FIG. 2.—Omentum ligated; appendix turned back exposing ulcer. Dotted line indicates parts severed.

for several days before subsiding. After this her progress was satisfactory. She got up on the tenth day and went about as usual until the 18th of November when she first consulted Dr. Brattain who discovered a mass in the right iliac fossa and sent her to her home and bed. In spite of his advice she called personally at his office the following day and he recommended operation. After considerable difficulty she was persuaded to accept his recommendation and came to the city where she walked into the hospital.

On opening the abdomen the condition shown in Fig. 1 presented. The omentum was firmly adherent over the mass and



was finally ligated and divided when it was seen that the mass was made up of an enormous prolongation of the uterus on which was cemented the appendix, the ileum and cecum. The adhesions were the strongest I have ever met with. A large part of the dissection had to be made by the knife. While separating the small bowel from the uterus about 2 ounces of thick creamy pus escaped on the packing. It was very hard to identify structure and in separating the cecum from the uterine diverticu-

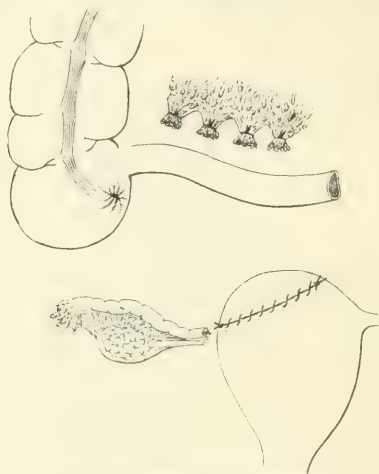


FIG. 3.—Diagram of end operation.

lum a rent was made in what was thought at first to be the ileum but subsequently proved to be the base of the appendix. When the appendix was amputated the amputation was made on the cecal side of the rent.

Upon removing the omentum, bowel and appendix from the diverticulum a large ragged ulcer was seen, as indicated in Fig. 2. The whole diverticulum was then removed by an elliptical incision and the incision closed leaving an appearance much as shown in Fig. 3.

In removing the diverticulum the right tube was severed from its uterine attachment and allowed to remain because it had escaped involvement its position being behind and below the

mass. A large gauze pack was introduced over the uterine incision and around the appendiceal stump.

Her convalescence was perfectly satisfactory. The pack was removed on the sixth day and replaced by a smaller one. She began nursing her baby on the second day and gradually took full charge of its feeding.

In discussing this case at our staff meeting objection was made to the statement that the date when the appendix became adherent to the uterus must have coincided with her attack of pain the latter part of July, a time when she was about six

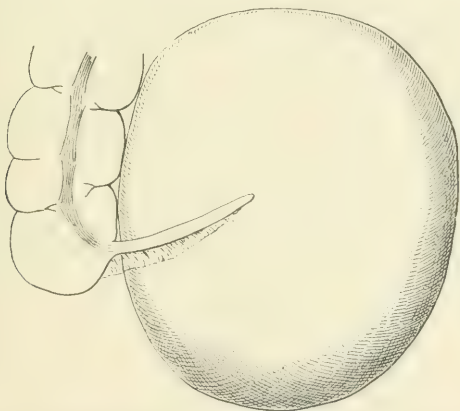


FIG. 4.—Probable position of appendix when adhesion occurred.

months pregnant, because at this time the appendix is supposed to occupy a position so far behind the uterus as to preclude the possibility of its being found on its anterior surface. It was held that there must have been a prior attack before the pregnancy occurred and that the appendix occupied the pelvis which is possible from its length. But we have nothing in the history to bear this out. Repeated questioning fails to elicit any attack previous to the one mentioned and my own opinion is that the adhesion took place at the time she had her abdominal pain. Anatomically I do not think it is impossible for a long appendix on a rather mobile cecum to get into the position illustrated in Fig. 4.

One of the most remarkable incidents about this case is the fortunate outcome following the employment of Credé's method of placental expulsion. I can only account for the failure to rupture the abscess at this time by the character of the adhesions, which, as I have said before, were the most intimate and strongest I have ever met with in this location.

By the same token we should have had an alarming postpartum hemorrhage because of the inability of the uterus to properly contract. This, however, must be dependent in large measure on the placental site. If the placenta occupied the other side of the uterus, contractions following birth would produce the usual hemostasis, or nearly so, and as near as she can remember, the loss of blood, while much greater than that which attended her first labor, was not alarming.

Heaton's contention (*Brit. Med. Jour.*, 1905, i, 463) that abortion *must* occur in all cases where the uterus forms a part of the abscess wall, is disproved by this case.

Since the foregoing was written another case of appendicitis occurring during pregnancy presented itself.

The patient, Mrs. C., twenty years of age, was in her third month of uterogestation when she was taken with pain in the right side followed by vomiting. Her pulse increased in frequency and she developed some fever. She became tender on pressure immediately to the right of the umbilicus and there was some rigidity of the muscles at that point.

On opening the abdomen a distended appendix appeared free from adhesions. After removal the mucous membrane showed areas of petechial hemorrhage extending to the peritoneal coat, and there were several small concretions present.

Her convalescence was perfectly normal, the temperature falling to normal in a few hours and no signs of miscarriage appearing, she was discharged from the hospital at the end of two weeks.

THE AMMONIA COEFFICIENT IN PREGNANCY WITH A  
REPORT OF SIXTY CASES.<sup>1</sup>

BY

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UNTIL pathology reveals to us the true cause or causes of the toxemias of pregnancy, we must rely on our clinical findings for scientific treatment. While caution should be observed in basing clinical procedures on the uncertainties surrounding the interpretation of urinary analysis, nevertheless, the laboratory has shown us the importance of nitrogen and its partition, and to Williams belongs the credit of its clinical application.

The fact that the ammonia nitrogen is decidedly increased in toxic vomiting and acute yellow atrophy is well established, its behavior in preeclampsia and eclampsia is not so striking.

We shall make no attempt to speculate on the pathogenesis of the toxemias, but beyond the realm of speculation is the fact, that clinically as a rule, from altered metabolism, the urine presents certain well-marked changes, the recognition of which greatly aids us in diagnosis, prognosis, and treatment. Briefly, these changes in general, consist in an increase in the ammonia nitrogen and amido acids, and a decrease in the total quantity of urine and urea nitrogen.

The practical application of the above has one serious disadvantage, the need of a skilled chemist for analysis, and the length of time consumed. The estimation of the total nitrogen by Kjeldahl's, and the urea and ammonia nitrogen by Folin's method, require the best part of twenty-four hours.

At the Hazard Laboratory, Syracuse Hospital for Women and Children, Dr. Groat, the physician in charge, has worked in collaboration with me in the analysis of urine in the toxemias of pregnancy in a series of cases. Preliminary reports of our results were published in the *AMER. JOUR. OBST.*, vol. lxiv, No. 6, 1911.

In his article Dr. Groat called attention to a method which he had originated for the determination of total nitrogen and ammonia nitrogen, which did not require special knowledge or

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

equipment, except, such as would be used in the ordinary analysis of urine and gastric contents. The length of time consumed is about one hour. Repeated trials by this method, controlling the test by the more elaborate processes, have not varied more than 1 per cent., a negligible quantity.

The analysis of urine in the toxic cases occurring in our service at the Hospital was so convincing, and corresponded so well with the published findings of Williams, that our curiosity was aroused as to the metabolism in normal cases, that is, cases with absence of toxic symptoms.

We are aware that even in the so-called normal pregnancies there is an alteration in metabolism in the majority of cases. In the latter weeks of pregnancy there is a decided tendency to the retention of nitrogen, a lowering in the percentage of urea nitrogen, and an increase in the ammonia nitrogen and amido acids, so that in the interpretation of analysis these factors must be taken into consideration, as well as the diet, exercise, and habits of the patient.

The value of this report is increased somewhat, we believe, by the fact that the cases were under personal observation in the Maternity Department of the hospital, and on practically the same amount of food and exercise.

In the sixty cases recorded in the series now under observation, fifty presented no toxic symptoms, and the amount of ammonia nitrogen was not in excess of normal. (Two cases in the series reached 11 per cent. and 11.3 per cent. respectively.) The average amount of ammonia nitrogen was 7.38 per cent.

We have not attempted to give in detail the urinary findings in these cases, reporting only those relative to the nitrogen content, in an effort to illustrate the dependence to be placed upon the ammonia percentage, which is normally about 5 per cent. It should be borne in mind that where the ammonia nitrogen continues above 10 per cent. we are probably dealing with a true toxemia.

The possible exception to this is a starvation acidosis, a condition not infrequently met with in the vomiting of pregnancy.

We believe that the acidosis can be differentiated from true toxic vomiting by the administration of bicarbonate of soda, preferable intravenously. A decided lowering of the ammonia percentage promptly follows as a rule in acidosis.

No.	Total Quantity.	Total N. Grm. p. m.	Ammonia N. Grm. p. m.	Ammonia, per cent.	Complications.
1	1300 c.c.	5.154	.49	10	None.
2	1980 c.c.	15.94	.693	4.3	None.
3	940 c.c.	21.08	1.974	4.9	None.
4	1880 c.c.	6.974	.329	4.7	None.
5	635 c.c.	5.280	.3277	6.2	None.
6	765 c.c.	5.569	.4953	7.8	None.
7	3820 c.c.	11.5	.6016	5.2	None.
8	1410 c.c.	10.46	1.085	10.3	None.
9	2400 c.c.	8.40	.462	5.5	None.
10	555 c.c.	3.418	.2331	6.8	None.
11	630 c.c.	4.077	.2886	7.8	Premature separation of the Placenta
12	600 c.c.	5.46	.4725	8.6	None.
13	3450 c.c.	19.07	.8452	4.4	None.
14	1660 c.c.	5.345	.581	10.8	None.
15	550 c.c.	1.347	.0841	3.5	None.
16	530 c.c.	9.60	.9275	10.4	None.
17	1030 c.c.	5.047	.3956	7.85	None.
18	1280 c.c.	5.734	.3814	6.6	None.
19	830 c.c.	7.727	.8134	10.6	None.
20	2010 c.c.	6.05	.4221	7	Placenta previa. centralis.
21	1280 c.c.	5.60	.56	10	None.
22	360 c.c.	2.620	.1901	6.49	None.
23	500 c.c.	5.055	.3480	6.8	None.
24	1600 c.c.	5.236	.571	10	None.
25	905 c.c.	6.088	.4434	7.3	None.
26	1300 c.c.	4.095	.4095	10	None.
27	1740 c.c.	12.18	.5481	4	None.



No.	Total Quantity.	Total N. Grm. p. m.	Ammonia N. Grm. p. m.	Ammonia, per cent.	Complications.
28	560 c.c.	5.488	.49	8.9	None.
29	1800 c.c.	10.08	.5985	6	None.
30	1200 c.c.	10.85	.665	6.1	None.
31	670 c.c.	2.345	.1407	6	None.
32	1100 c.c.	9.24	.8855	9.6	Pernicious anemia.
33	880 c.c.	8.40	.616	7.3	None.
34	1600 c.c.	16.8	1.176	7	None.
35	1000 c.c.	7	.7	10	None.
36	1500 c.c.	8.925	.7875	8.7	None.
37	1500 c.c.	8.4	.525	6.2	None.
38	950 c.c.	5.985	.2826	4.7	None.
39	1680 c.c.	8.232	.9114	11	None.
40	960 c.c.	11.08	.839	7.5	Justo-minor pelvis.
41	2370 c.c.	19.07	1.659	8.7	None.
42	1400 c.c.	6.3	.49	7.9	None.
43	800 c.c.	7	.56	8	None.
44	860 c.c.	10.23	.602	5.8	None.
45	1100 c.c.	3.85	.4375	11.3	None.
46	1200 c.c.	13.02	.651	5	None.
47	1800 c.c.	11.34	.5355	4.7	None.
48	1100 c.c.	10.39	.7231	6.9	None.
49	1300 c.c.	19.01	.8351	4.3	None.
50	980 c.c.	12	.5480	4.5	None.
51	650 c.c.	3.412	.6142	18	Para-i, 8 mo. Patient advised by friends to abstain from food as much as possible. Practically on starvation diet. After a few days of proper diet, ammonia dropped to normal. Diagnosed starvation acidosis. Labor normal at term.

No.	Total Quantity.	Total N. Grm. P. M.	Ammonia N. Grm. P. M.	Ammonia, per cent.	Complications.
52	750 c.c.	11.28	.6562	5.8	Para-iii, 7 mo. Headache, visual disturbances, edema, albumin 30 per cent. by bulk, casts. History of previous renal trouble. Absolute rest in bed and milk diet prescribed. Symptoms increased. Premature labor induced. Diagnosed nephritic toxemia. Recovery.
53	600 c.c.	6.51	.525	8.06	Para-ii, 7 mo. History of headache, edema, visual disturbances, and albumin for several weeks. Saw case in consultation after second convulsion. Casts, albumin 40 per cent. by bulk. Cervix rigid and undilated. Abdominal Cesarean after fourth convulsion. Diagnosed nephritic toxemia. Recovery.
54				28	Para-ii, 3 mo. History of puerperal insanity with previous pregnancy. Patient vomits constantly, headache severe. Therapeutic abortion. Vomiting ceased immediately. Diagnosed toxic vomiting. Recovery.
55	365 c.c.	4.394	.8303	18.8	Para-i, 7 mo. Patient very emaciated. Vomits almost constantly. Rectal feeding and eliminative treatment without result. Premature labor induced. Vomiting ceased. Diagnosed toxic vomiting. Recovery uneventful.
56	800 c.c.	4.592	.854	18.6	Para-i, 2 mo. Nausea and vomiting constant since conception. Abortion advised and refused. Ammonia increased to 32 per cent. Patient gradually failed and jaundice developed. Toxic meningitis and acute yellow atrophy probable cause of death. Autopsy refused.
57	1620 c.c.	10.206	.7089	6.7	Para-ii, 7 mo. About forty-eight hours previous to convulsion, urine was as above. History of previous renal trouble. Saw case in consultation after second convulsion. Obtained 1 ounce urine by catheter. Albumin 30 per cent. by bulk and casts. Cervix rigid and undilated. Abdominal Cesarean. Convulsions ceased, but complete suppression of followed. Death twelve hours later. Diagnosed nephritic toxemia.
58	850 c.c.	5.32	.84	15.6	Para-i, 8 mo. Patient admitted to hospital after fourth convulsion. Albumin 8 per cent. by bulk, no casts. Cervix rigid and undilated. Abdominal Cesarean. Diagnosed eclampsia. Recovery.

No.	Total Quantity.	Total N. Grm. P. M.	Ammonia N. Grm. P. M.	Ammonia, per cent.	Complications.
59	790 c.c.	4.27	.945	22.8	Para-i, 8 mo. Patient admitted to hospital after sixth convulsion. Albumin 1 per cent. by bulk, no casts. Cervix obliterated. Internal podalic version. Diagnosed eclampsia. Recovery.
60	770 c.c.	3.15	.4984	15.5	Para-i, 4 mo. Vomiting, headache, and mental depression. Patient in a more or less semi-toxic condition until the fourth month, when the ammonia dropped to normal, and the case went to normal labor at full term. Only by careful diet and elimination, could the ammonia be kept below 10 per cent.

## SUMMARY.

In cases under constant observation, with same amount of diet and exercise, and with absence of toxic symptoms, the ammonia percentage remained normal.

An analysis of the cases indicate, that in a great majority the metabolism is decidedly disturbed, with nitrogen retention.

The small number of apparently normal cases that approximately approached normal standards.

Impossible to always determine the clinical condition of the patient from analysis of the nitrogen alone, but a low ammonia percentage is of diagnostic and prognostic import.

A characteristic increase in the ammonia nitrogen in cases with toxic symptoms.

We believe it indicates the gravity of the toxemia, and that it determines the safest treatment.

It may indicate the presence of a grave toxemia, when clinical symptoms are absent.

Of great value in distinguishing between nephritic toxemia, preeclampsia, and eclampsia.

It should, however, not be relied upon exclusively. All physical signs and symptoms must be taken into consideration, in arriving at a diagnosis.

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## METHODS OF DIAGNOSIS IN LESIONS OF THE UPPER URINARY TRACT.<sup>1</sup>

BY

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IN lesions of the kidney or ureter the first symptoms that attract the attention of the patient, causing him to seek the advice of a physician, are urinary disturbances and pain. The pain may be severe or mild, intermittent or constant. The onset may be sudden or gradual. If persistent and severe the pathology is usually one requiring surgical treatment. If due to calculus it is usually severe but intermittent. If due to malignancy it is more constant but not so severe. If the kidney is tubercular or abscessed there is little pain, but tenderness upon pressure. With a patient presenting any one of these groups of symptoms, the more refined methods of examination are not at first employed but what may be termed the grosser methods are usually selected.

*Inspection.*—The patient is placed on the back and in a light so cast that the lateral and abdominal walls are in a shadow. If suffering from an acute infection, as for example acute nephropysis, a phenomenon corresponding to Lytton's sign is observed—the muscles on the normal side move with respiration while the diseased side remains immobile.

*Palpation.*—Spasm of certain muscles, however, is usually much more readily detected by palpation than by inspection; especially is this true in spasm of the lumbar muscles, which may include the abdominal muscles as well. When correlated with the patient's history, spasm of the quadratus lumborum is almost pathognomonic of surgical disease of the kidney.

*Tenderness.*—In subacute cases tenderness will be found to exist at the junction of the last two ribs with the outer margin of

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

the erector spinæ. In acute cases the area of tenderness is broader. This tenderness is best elicited by deep pressure with the thumb tip.

*Exercise.*—Fixing the pelvis and having the patient bend the body forward and backward, also laterally, will in obscure cases enable one to localize the disease. A peculiar gait is acquired by some patients in an attempt to relax the psoas muscle. Pain upon hyperextension of the thigh is based on the same principle. Walking increases pain in the presence of calculus in the kidney, while with stone in the ureter pain is unaffected.

*Cutaneous Hyperalgesia.*—Known as the kidney zone, is a triangular space, its base extending from the lower dorsal spinous process to the fifth lumbar spine with its rounded apex at the edge of the rectus muscle. Also we have what may be termed the ureteral zone, this being 2 or 3 inches in width, its upper margin corresponding with the lower pole of the kidney and extending from the vertebræ to the anterior axillary line, thence obliquely downward, terminating in the labia (scrotum and penis in male). In renal stone the zone can be demonstrated in nearly one-half the cases. In ureteral calculus the ureteral zone is present in about three-fourths of the cases. This zone is present in pyelitis, pyelonephritis and hydronephrosis. The more acute the affection, the more acute the hyperalgesia.

*Reflex Pain.*—The presence of stone at the pelvic brim frequently causes irritation of the iliac plexus, giving rise to referred pain in the knee and thigh.

Having studied the patient as regards the above phenomena, and since the keynote to success in the treatment of genito-urinary diseases depends upon methods that will obtain absolute accuracy in the diagnosis and exact location of the site of lesions in the tract, one should now resort to the more refined methods.

*Laboratory Methods.*—The urine contents are important, and should be carefully studied, the estimation of total solids being of much value. To be of true diagnostic value, a twenty-four, or perhaps a seventy-two hour specimen is collected. The general diagnosis of kidney lesion may readily be made by the occurrence of albumin, mucus, kidney casts, kidney epithelium, pus, blood, bacteria, crystals, and also portions of tumor. The total renal function may now be further estimated. This may be accomplished by one or more of the several functional tests. By segregation of the urine the individual kidney function is proven.

*Functional Tests.*—The presence of sugar after the injection of phloridzin shows the secreting capacity of the kidney. After the injection of  $1/10$  grain of phloridzin sugar, appears in the urine in from fifteen to thirty minutes. The healthy kidney secretes about 1 per cent. of sugar, the diseased less, depending on the extent of the disease.

Cryoscopy is troublesome and lends no more light than the estimate of urea.

With the electroconductivity of the urine I have had no experience, but believe it to be of no practical value.

Chromocystoscopy is useful if, for any reason, the ureter should not be catheterized, or if on account of a badly diseased bladder neither ureter can be located. By injecting 1 dram of a 4 per cent. solution of indigocarmin into the buttocks, the blue urine will flow into the bladder in five minutes in a good strong stream, reaching its height of color in thirty minutes. From the diseased kidney the colored urine appears later, does not reach the same intensity of color, and flows more sluggishly. The diagnostic point that can be gained by this very simple test is that, with strong probability, considering the rarity of horseshoe kidney, we are dealing with two functioning kidneys and the capacity of each may be estimated.

The phenolsulphonaphthalein renal test<sup>1</sup> is the latest and probably the best functional test in use. It accurately demonstrates the functional abilities of the kidneys and may be used to differentiate the comparative activity of the two renal bodies when the excretions are separately collected. It is useful both to the surgeon, in preoperative examinations, and to the general diagnostician. It is remarkable in that 50 per cent. (approximately) of cases, 6 mg. hypodermic injection given into the lumbar muscles is eliminated in an hour, its elimination beginning in about five minutes. Three hundred cubic centimeters of water should be given the patient half an hour before injection, to insure free urinary secretion.

"Phenolsulphonaphthalein is better adapted for use as a functional test than any other drug previously employed for the same purpose on account of its early appearance in the urine and the rapidity and completeness of its elimination by the kidney and the reliance to be placed on its findings." "The method of quantitative estimation of the amount of drug excreted is simple and exceedingly accurate." "It is of immense value from a

<sup>1</sup> For the technic of this test see the *Arch. Ind. Med.*, Mar. 15, 1912, p. 284.



diagnostic and prognostic standpoint in nephritis, inasmuch as it reveals the degree of functional derangement in nephritis, whether of the acute or chronic variety." "In the cardiorenal cases so far studied the test has proved of value in determining to what degree renal insufficiency was responsible for the clinical picture presented." "The test has proved of value not only in diagnosing uremia from conditions simulating it, but has also successfully indicated that uremia was impending when no clinical evidence of its existence at the time was present." "The test has proved of great value in revealing the true renal condition in cases of urinary obstruction." "It is here of more value than the urinary output, total solids, urea, or total nitrogen, and enables the surgeon to select a time for operation when the kidneys are in their most favorable functional condition." "The improvement in the renal condition in cases of urinary obstruction following the institution of preliminary treatment is strikingly indicated by this test." "In unilateral and bilateral kidney diseases the absolute amount of work done by each kidney, as well as the relative proportion, can be determined when the urines are obtained separately."—Drs. L. G. Rowntree and J. T. Geraghty.

*Instrumentative.*—For the collection of urine the catheter need be inserted only 3 or 4 inches, distance to be measured by zebra catheter. If the catheter becomes clogged, the urinary flow may be established by injecting, through the catheter with a hypodermic syringe, a small amount of fluid.

If only one ureter can be catheterized, the urine should be collected from it, and examined for pus, blood, bacteria, etc.

Should tuberculosis be suspected, but the specific bacillus not demonstrated, a portion is collected in a sterile tube, centrifuged, and the sediment injected into the peritoneum of a guinea-pig, which, when tuberculosis is present, leads to the development of tubercular peritonitis. The most reliable of diagnostic tests are the animal inoculations. A pouting, markedly inflamed meatus, with cloudy urine from the affected side, when tuberculosis has been excluded, is evidence strongly pointing to stone in the ureter near the meatus. The stone may at times be seen protruding partially. The ureteral catheter encounters obstruction in about 75 per cent. of cases of ureteral stone. About two-thirds of these can be passed by the catheter. When the obstruction is passed there is a sudden flow of urine, the amount depending on the degree of dilation. The urine here collected and examined chemically and microscopically has its bearings, it being, in presence of stone, dark, smoky and reddish-yellow, containing pus and blood cells; while with obstruction in tuberculous ulcer, or which occurs in anatomic hydronephrosis, the

urine above the obstruction is pale, though cloudy to a varying degree.

If, in passing, the catheter warps or does not go smoothly, it may have become caught in a fold of mucous membrane, when it can be dislodged by injecting a little fluid (olive oil) through the catheter with a hypodermic syringe. After passing this point as in all cases where there is no actual obstruction, no sudden flow of urine is noticed. If stricture of the ureter is present there will be, after passing this point, a hugging of the catheter.

Introducing the styleted catheter, using a very pliable wire, ordinary fine fuse-wire, or better still, a catheter impregnated with collargol previously injected, and radiographs taken at various angles, is a great aid. Taken stereoscopically another dimension, that of depth, is gained, so that the distance from the ureteral catheter and the other shadow-casting substance can be quite accurately estimated and the course of the ureter shown. This enables one to exclude concretions in the appendix, phleboliths, calcified areas in the blood-vessels of adjacent tissues, tubercular deposits, scars, feces in the colon, pathologic changes in the uterus and adnexa, and also skin tumors, such as warts and nevi. It, too, may show calcified areas in the ureteral wall or a ureteral calculus that has ruptured through and become encysted into the surrounding structures.

With a marked dilatation of the ureter the catheter may meet with no obstruction since the stone may be playing up and down in the ureter, acting as a ball valve. Here the stone might show in the radiograph to be some distance from the catheter. It can be proved to be in the ureter by distending the ureter and pelvis with a collargol solution and radiographing. Before this procedure is carried out, there should be a previous radiograph showing the suspected shadow to be some distance from, but within a centimeter of, the styleted catheter shadow. In case of doubt as to the shadow from a small, flat, thin, soft stone, the injection of gas has been tried and is of much value, since it will show a dark area in contrast to the white area shown on the more dense deposit.

With the catheter in the kidney pelvis its capacity can be proved by the injection of fluid, and by distending the pelvis to its full capacity; pain of a certain clinical character can also be produced. In pyelitis urine may be collected and the specific germ demonstrated. Conditions in the kidney proper that are apt to confuse are single cortical stones, tuberculous lesions, gall-

stones and superficial bodies, all of which can be, by the cystoscopic data and the aid of the radiograph, pretty well diagnostically cleared up. In cases which are difficult to examine, the diagnosis has to be worked up step by step. If we can only get urine from one kidney we should endeavor to do so.

*Conclusion.*—It has not been the intention in this paper to specifically describe the technic of different diagnostic methods; it has been the intention, however, to emphasize the importance of not relying wholly upon symptoms and the clinical appearance, but to use every means to accurately diagnose the existing conditions. True, we must always consider the general clinical picture, and also is it true, that one should, in the differential diagnosis, be familiar with the diagnosis of disease in the surrounding viscera. Yet the data derived from a careful urinalysis, the cystoscope and x-ray are necessary to an accurate diagnosis. It is for the frequent and systematic use of these valuable aids, which will bring us so many happy surprises, that I am making a plea. If I have succeeded in impressing upon some one the importance of carrying out in detail such an examination, the object of this paper is accomplished.

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711 SHURLY BUILDING.

## RAPID DILATATION AND ACCOUCHEMENT FORCÉ.<sup>1</sup>

BY

HENRY S. LOTT, M. D.,

Winston-Salem, N. C.

(With Two Illustrations.)

PRESENTATION of this subject is prompted by two motives. First, to emphasize the importance of delivery per viam naturales whenever it is possible; and second, to suggest methods of its accomplishment when such delivery is indicated.

Of the obstetric emergencies demanding prompt delivery, eclampsia is most important and also of most frequent occurrence. Waiving vague theories and confronting a crisis, the eclamptic woman is a surcharged battery; her centers responding to the stimulus of either excessive or faulty metabolism. Such recognition and such acceptance of the eclamptic explosion is only in keeping with present-day advancement. The content of the uterus has become a foreign body and an irritant, perverting metabolic equilibrium and creating pressure, thus passing to the category of conditions demanding prompt surgical relief.

In such conditions we may have, a *focus* of pain, a *focus* of infection, and a *focus* of possible disaster, from either pressure or rupture; and a pregnancy of this type, if at all advanced, well-nigh completes the trinity of vital dangers that should always appeal to the surgical conscience.

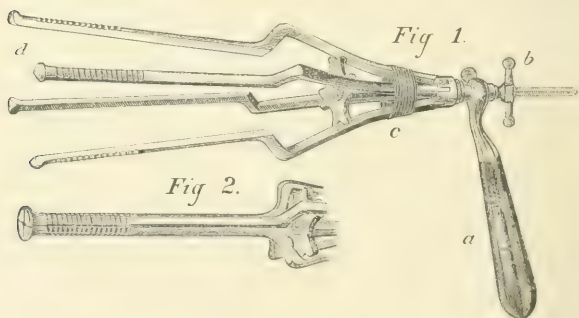
Confronting such a crisis, we believe that elimination, with all that the term conveys, with prompt removal of the causative focus, is the leading indication; and we also believe that the avenues of outlet established by nature are most readily and practically available in the majority of such emergencies.

The Cesarean section skilfully done—as it is by the master hand of a Fellow of this Association—is ideal under proper condi-

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

tions, when the skill and the accessories are available. But it is "out in the field" where emergencies arise in which prompt action is essential and such conditions cannot be obtained.

The methods of dilatation that have served me best are two—*manual* and *instrumental*. Manual dilatation, in which the fingers are used as dilators, I really deem of most importance, because it is always available and with a clean hand is comparatively safe. The index-finger (its tip being most conical), is "wormed" into the os by a spiral motion, and with it gentle traction is made toward the symphysis, sufficient force being used to gradually make room for the introduction of the middle finger. Now, the index-finger is held taut, its fixed point inclining to the anterior portion of the cervix, while the middle finger, introduced to the full distance of its first joint, is repeatedly flexed with force, thus making room for the ring finger, with which force is applied to the encircling os in like manner as with



the middle one. Through this maneuver room is made for the little finger and also, often simultaneously, for the thumb. Upon the introduction of the latter, the leverage becomes most powerful and the dilatation is soon accomplished.

An excellent method of practising this maneuver is by making a closed circle with the thumb and index-finger of the left hand and then dilating it with the fingers of the right.

The result of this method of dilatation, especially under chloroform, is very prompt, and the dilatation is effected without the introduction of foreign bodies into the uterine cavity. It may be practised at any time with the two hands, used at almost any

stage of gestation, after the very early months, and, when the fingers are properly educated and the muscles trained to their work, dilatation can be accomplished in a very few minutes.

The second method—instrumental dilatation—is one devised in 1892, before my fingers had been trained to do their work and was the outcome of a critical emergency demanding such assistance.

The mechanism of the instrument is simple, but accurate, the dilatation gentle but sure and sufficient to allow the introduction and application of either long or short forceps.

Fig. 1 shows the dilator open; *a* is the handle of hard rubber (the 1912 model has a metal handle, the better for sterilization), rotating on a shaft and tightened with a setscrew; *b* is the dilating screw, graduated with letterings and lines to indicate the exact distance the points of the dilating blades are separated; *c* is a heavy rubber band for securing the approximation of the blades for withdrawal, when the dilation is completed; *d* represents the four dilating blades, 6 inches long, corrugated to prevent slipping of the encircling os, each having a delicate, flange-like projection at its distal point to hold it securely within the os. The blades are highly polished, no sharp edges to pinch or otherwise injure the mucous membrane of the parts, and when closed for introduction (see Fig. 2), the distal points represent a circle the size of a silver dime, with a slight concavity presenting to the child's head, for safety in case of contact during a pain.

Thus we have in the four blades *four points of peripheral irritation in the circumference of the os*, with a dilatation of from 3 to 3 1/2 inches, after having deducted the probable yielding due to the spring in the blades which it is impossible to prevent.

The position of the patient for introducing the dilator must depend upon several conditions, chief of which are the stage of gestation and the position of the os. If, in a multipara, gestation is near term, the vagina large and the os easily reached by the examining finger, no especial deviation from the ordinary dorsal position will be necessary. If, however, we have either a primipara or a multipara with gestation partially advanced, the parts firm and unyielding, and the os buried in the hollow of the sacrum, it will then be necessary to elevate the hips, relax the system with chloroform, and pull down the perineum either with the hand or the duckbilled speculum in order to secure the introduction of the dilating blades.

After introducing the dilator into the os the handle is firmly



grasped in the left hand of the operator, adjusted by the set-screw in the best position for convenience relative to the thighs and nates, and the right hand is left entirely free to control the process of dilatation, the rapidity of which must be governed by the condition of the parts.

My first use of the dilator was in June, 1892, when I was called about daybreak to a patient who had been in convulsions since midnight. I found a large plethoric woman, wanting some days of full term, with the os only sufficiently open to admit one finger. Convulsions were recurring about every fifteen minutes. This was several miles in the country. With the husband to give the chloroform, I elevated the hips by placing a pillow beneath them and proceeded to make forcible dilatation with my rapid obstetric dilator. Within an hour I was able to apply Barnes' forceps above the superior strait, and in an hour and a quarter I had delivered the mother of a healthy living child in good condition.

The mother had several convulsions while the dilatation was in process, during which, of course, I withdrew the blades, and one after the child was delivered. There was a slight tear of the cervix and the mother had some fever afterward, but eventually made a good recovery. This dilatation could have been done in one-half the time, had the emergency demanded it, but believing the vital powers of the woman sufficient to justify my disposition to conservatism, I operated with much deliberation, giving the encircling fibers of the os ample time to yield to the stimulus of the dilating blades.

That the knowledge of my device was not limited to this country, is shown by the following copy of a postal card from the editor of the *North Carolina Medical Journal*:

WILMINGTON, N. C.,  
December 17, 1892.

My dear doctor:

I thought you would appreciate knowing that we have just received an application for our Journal containing your uterine dilator, from Berne, Switzerland.

Yours very truly,  
*No. Ca. Med. Journal,*  
R. D. JEWETT.

Thus it would seem that Bossi and I, almost simultaneously and absolutely independent of each other, devised and employed,

instruments which were practically identical in construction.

Bossi's dilator was devised in 1889, and first described in 1891. (*Gazetta degli pedali* Milano, no. 29, 1891). It was described more fully the following year (*Della provocazione artificiale del parto e sulparto forzato col mezzo della dilatazione meccanica del collo uterino. Ann. di ost. e ginecol.*, Dec., 1892), but did not become generally known outside of Italy until 1901, when Leopold introduced it into Germany.

Accordingly, while I cannot claim to be the only original inventor of the instrument, it would nevertheless follow that to me belongs the credit of being the first to invent and make use of such a device in America, as I had employed it successfully nearly ten years before Bossi's invention was heard of in this country.

Finally, in the matter of rapid dilatation, let me emphasize the fact that the metallic dilator is a powerful instrument, and, while it should have a place in obstetrics, it should only be used in extreme emergencies, where prompt delivery, through the natural outlet is essential to saving life and the dilatation cannot be accomplished by manual methods.

Accouchement force, it seems to me, should have a broader sense than the one of its definitive acceptance; applying not only to cases of induced labor, but to all cases in which either forceps, or force, are used in effecting delivery. Let us, therefore, at this time consider it in such relation.

As a matter of fact, I believe that forceps are applied more often than they should be. In taking this position, we must accept and consider the dangers accompanying their use. These dangers are two, *infection* and *trauma*.

In gynecologic surgery, a very large proportion of the patients present either an extended infection which has not cleared up or a trauma to the outlet, needing repair. Most of these conditions date from a "confinement," and a very large proportion of them have had a "forceps delivery."

In looking over some brief, practical notes on 800 cases of labor in private practice, I find that forceps were applied fifty times. Of these cases, 252 were primipara, and 548 multipara. Although the proportionate number is small, it seems that only ten of these were cases of convulsions, the remainder being a demand for help either on account of a rachitic pelvis, uterine inertia, breech presentation, placenta previa, or such inequality between the child's head and the maternal outlet, as either to

prevent engagement at the pelvic brim or endanger the maternal soft parts by prolonged pressure.

To emphasize and illustrate my plea for conversatism in the use of forceps, I recall among my cases two in which forceps were applied, resulting in a complete tear with much contusion of tissue and destruction of the sphincter and two in which the head alone wrought similar results in the posterior wall, although not quite so extensive. The four were subjected to immediate repair. In the latter two, where forceps were not used, the repair was successful, giving bowel control. The forceps cases, one of the tabulated list in private practice and one in hospital service, were failures at the primary operation. The most extensive of these, the one in private practice, had a subsequent operation after several months, in which the classic Emmet procedure gave an excellent result, restoring tone and function and even standing the test of a subsequent confinement. The second one, in the hospital service, would not remain for a subsequent operation and I fear is still a victim of the accident. These were both primipara and both were having convulsions.

In brief résumé, and again in emphasis: all cases of puerperal convulsions, if at all near full term, with even initial labor pains, *should be delivered*. With strict asepsis, forcible, rapid dilatation, preferably manual, the application of forceps, and delivery by the natural outlet, is most safe, most readily available, and will give the best results in a very large majority of cases. The delivery should be effected under ether and with care and deliberation. In the two cases cited, of sphincter tears, I firmly believe that greater deliberation in delivery would have lessened the extent of the injury.

In other conditions mentioned, viz., inertia, breech presentation, placenta previa, excessive size of the fetus with delayed engagement, delayed expulsion from the vagina endangering the maternal soft parts from pressure, rachitic pelvis, etc., forceps delivery is indicated, and under carefully aseptic conditions should be promptly effected. Extreme care, however, should be used in determining exact conditions relative to both mother and fetus, and the amount and direction of the traction force, together with the speed of delivery, should be governed entirely by these conditions.

As "timesavers," forceps in any case and under any conditions at all, introduce two elements of danger—*infection* and *trauma*—making their use *unwarranted*; the question not being, "will the

patient bear a forceps delivery," but, "is the maternal outlet yielding," and "will delivery be safely effected if we will wait awhile?"

In many cases, when we have become very weary of our watch, and the temptation is very great, a walk in the moonlight or the early morning shadows, will help us very much. When we return we are refreshed, the patient has had a "nap" and as the morning sun, with the rising tide of life, shoots its rays across the eastern horizon, the pains return with renewed vigor, and safe delivery is soon accomplished.

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308 MASONIC TEMPLE.

#### DISCUSSION ON THE PAPER OF DR. LOTT.

DR. RUFUS B. HALL, Cincinnati.—I rise to discuss that part of the paper which pertains to rapid delivery by instrumentation. I think that is right and justifiable, but when it comes to the dilatation of the cervix with a metallic instrument, such as the one illustrated here, I do not doubt but what the cervix can be dilated with this instrument or more probably torn. I think it requires delicacy of manipulation and great care to control the dilatation. I should think it would be an easy matter to tear a cervix with an instrument like this, and where the real object of the doctor is to deliver the woman quickly when she is in convulsions, it occurs to me that she could be delivered more safely and with less risk by a vaginal Cesarean section. I do not believe I could deliver a woman with this instrument by dilating the cervix without serious injury to her cervix. I would rather repair what injury I might do afterward by making a vaginal Cesarean section and give her as good a chance as I could by a clean operation. I would condemn the use of this instrument. I cannot imagine when I would use it for the purpose for which it is intended.

DR. ASA B. DAVIS, New York.—Accouchement forcé has been tried, and it was the method of delivery before Cesarean section had reached the position which it now holds. Our experience with that method of delivery has been that while the cervix is dilated, more often it is lacerated. We do not resort to dilatation in these cases, to any great extent, as the laceration or trau-

matism is very severe. There is no doubt about that in our minds. We start the laceration before the child is delivered. In delivering the child in our experience the laceration has extended beyond the point at which we begin to deliver the child, and often it has extended so that large vessels are torn through. In some instances we used to rely upon packing the uterus and packing the lacerations. We can pack these women so that hemorrhage will be checked for possibly an hour. By that time the packing has become wet at the site of the bleeding, and the packing is usually taken out. The hemorrhage goes through the packing that is already in. The packing is taken out and some more is put in. In a number of cases, the patients have died from hemorrhage and shock. In the cases reported very often we find that the cervix, the pelvic floor and sphincter are lacerated. With our present knowledge we can go in from above and make a clean-cut wound. We know the dimensions of it. We can close it quickly in a clean surgical way, and the cervix is left as it was before we began.

As to the necessity of the practitioners who are isolated and are distant from help, I will say that the means of communication with small hospitals has developed to such an extent that help can be had in the majority of cases, and I believe very thoroughly in cases where we have to deliver rapidly that Cesarean section is the preferable operation, and that abdominal Cesarean section has a decided advantage over the vaginal operation. Through the vagina we can get the child out quickly, but it is another matter, as I have experienced, to close wound and get good coaptation. In subsequent deliveries if we resort to vaginal Cesarean section, those old scars are very much more apt to tear.

DR. JULIUS H. JACOBSON, Toledo, Ohio.—The subject of accouchement forcé is one of the most important that can be brought before this association. I rise to speak a word in favor of vaginal Cesarean section. The more experience we have with this operation the better do we understand the indications for its employment. My experience with vaginal Cesarean section is limited to six cases, in which I have learned something regarding indications for the operation. I have learned that the operation is very easy when performed before or about the twenty-eighth or thirtieth week, and that it is difficult when performed at full term. The objections raised by Dr. Davis are well taken, against the operation at full term. Vaginal Cesarean section, when performed for eclampsia at or before the twenty-eighth or thirtieth week, is an operation that can be done with great facility and I believe should always be performed in preference to the abdominal Cesarean operation. It is in the limitations of vaginal Cesarean section that we will get the best results with it. I believe that the term of vaginal Cesarean section should be changed to that of vaginal hysterotomy, which in my opinion better expresses the real scope of the operation.

DR. SAMUEL W. BANDLER, New York.—There are a great

many cases where labor is already going on; the cervix is somewhat dilated, but it is not dilating as rapidly as you wish it, yet there is no reason why you should not deliver the woman through the vagina. There is no reason why, in these cases, where you have no strict indications before you, you should find it necessary to do abdominal Cesarean section. In those cases where the cervix dilates only a little, and yet we are in a hurry, I have never had any difficulty, even where the cervix was only slightly dilated at first, in easily introducing two fingers, and then bringing about complete dilatation in a short time. Where the cervix is not dilatable, there is a great field for vaginal Cesarean section. After we have begun the method of dilatation by the fingers, and find it does not work well, or find it is not practicable, vaginal Cesarean section is an admirable method. A procedure that aids very much in carrying out vaginal Cesarean section is one I have tried in three cases, using it first in a case of placenta previa lateralis. Where we wish to go ahead quickly and dilate, and at the same time stop bleeding, I have followed the method of Dührssen, introducing a Champetier de Ribes bag, and with that in place, we can make a transverse and longitudinal vaginal incision, separate the bladder, and do the anterior and posterior hysterotomy operation beautifully. I have never seen a tear from the associated delivery, either by the hand or forceps, nor any gaping of the wound that I could not sew up quickly. I can see every point where I apply sutures.

DR. LOTT (closing).—I am sorry the discussion was not more extensive, but what has been said only emphasizes the importance of the subject. I quite agree with the gentlemen who say that the metallic dilator is a very powerful instrument, and a very dangerous instrument in the hands of those who are not skilled in its use. If it is used at all, it must be used very carefully and very skillfully. Please let me emphasize this point and let it be distinctly understood, that artificial dilatation, when it is essential, may be accomplished with far greater safety by the manual method.

## TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

*Meeting of February 14, 1913.*

*The President, GEO. GRAY WARD, JR., M. D., in the Chair.*

### SEMICENTENNIAL CELEBRATION.

On February 14, 1913, there was held at the University Club in New York City a dinner commemorating the fiftieth anniversary of the founding of the New York Obstetrical Society, one of the oldest of its kind in this country. In addition to the members, who were well represented on this occasion, a number of well-known obstetricians and gynecologists from other cities were present as guests.



The menu, which was designed by Dr. R. L. Dickinson, was most artistic and appropriate, containing a series of excellent portraits in half-tone of the founders and early members of the Society.

The proceedings included the President's address and the remarks of the various speakers and are herewith presented. Considerable interest was centered in the lantern pictures of earlier members of the Society, each described in a brief manner by the individual speakers.

*The President*, DR. GEO. GRAY WARD, JR., spoke as follows:

THE New York Obstetrical Society was born fifty years ago, during the troublous times of the Civil War, and fifty years after the birth of J. Marion Sims, whose centenary occurred last month.

On October 9, 1863, twelve gentlemen met at the residence of Dr. T. Gaillard Thomas, for the purpose of organizing a Society among those interested in the study of the diseases of women and children.

It will be observed that the semicentennial of this Society does not occur for some months to come, but in the presence of this audience it is scarcely necessary for me to remind you that a period of gestation always precedes a birth, and as it is now eight months or more prior to that event, we are justified in assuming that it is now fifty years since the conception of this Society took place in the brains of its founders, and we meet here to-night to celebrate it accordingly.

The founders of this Society, those who were present at that first meeting of organization, were Drs. Barker, Budd, Cock, Emmet, Jacobi, Noeggerath, Peaslee, Reynolds, Sabine, Swift, Taylor and Thomas. But two of these gentlemen are alive to-day, Drs. Emmet and Jacobi. Absence in Florida prevents Dr. Emmet from being our guest to-night, but we are more than grateful to have Dr. Jacobi with us.

At this first meeting it was decided that the Society should be limited to twenty members, and that the meetings should be held every two weeks at each other's houses, and a committee was appointed to draft a constitution and to nominate officers.

The first regular meeting was held on October 20, 1863, at the residence of Dr. Isaac E. Taylor, and the following officers were elected: President, Thomas F. Cock; Vice-President, Thomas Addis Emmet; Recording Secretary, Foster Swift; Corresponding Secretary, Abraham Jacobi; Treasurer, S. B. W. McLeod.

The first scientific contribution was made by Dr. Emmet, who presented a specimen of a uterus, containing a large fibrous polyp, attached to the fundus by a pedicle. The first case report was narrated by Dr. Budd, of a persistent occipito-posterior position, delivered with forceps after the head had been three hours on the perineum.

It is most interesting to note that the first paper read before the Society was by Dr. Emmet, on "A Radical Operation for the Cure of Procidencia" and after fifty years we haven't yet settled the best way to cure this condition.

The earlier meetings consisted largely in the narration of cases of interest occurring in the practice of the members, and pediatrics

took a prominent place. Fifty years does not seem very long, but when we consider the extraordinary progress that has been made in medical science, and especially in gynecology during the last half century, we can appreciate what changes have taken place in that time.

It is hard for us to realize that it was only in 1862 that the Professor of Obstetrics in the Jefferson Medical College, during a lecture, stated with a warmth that did more credit to his humanity than to his science—"that the men who go about the country ripping open women's bellies, should be indicted for murder."

The men who made gynecological history in the earlier life of this Society were giants in their day. A new field was opened to them, and the workers were eager to cultivate it, to till the soil, and that it has brought forth abundant crops of knowledge in the gynecic art, we are here to testify.

You will have an opportunity of seeing the faces of some of these pioneers later, and others will tell you of their lives and work. You will also hear of the work of the Society, and may judge for yourselves whether its fifty years have been fruitful ones, and if it has accomplished the purposes for which it was organized.

And what of the future of the Society? Surely those of us who are now living have a rich heritage left to us, and it behooves us to carry on the work that our predecessors left unfinished, with the same spirit and earnestness of purpose that they manifested, for there are many problems yet to be solved.

As long as women bear children and the gonococcus flourishes there will be need of the obstetrician and the gynecologist.

Now gentlemen, we have a long program before us, and other speakers are anxious to address you, so I ask you to fill your glasses and drink to the memory of those who have gone before and to the hope that the next fifty years of our Society may be as fruitful in knowledge and as beneficial to womankind as were the past.

The President then read the two letters following:

Palm Beach, Fla., Feb. 7, 1913.

Dr. HOWARD C. TAYLOR, Secretary

N. Y. Obstetrical Society.

Dear Doctor:

I was a founder member of the Obstetrical Society, the proposer for its organization and the first president, if I remember correctly, or at least it was offered to me, and I read the first paper I think on flexure of the cervix, or possibly procidentia and it was the first paper published in the New York Journal of Medicine, afterward known as Appleton's Journal.

So far as I know I am now the only one living of the first members. I would like to be with you on the 14th, but can only be so in spirit, as I have become very infirm and have to spend the greater part of my time in bed. But my brain is yet in good working order and I spend on an average

five hours a day in literary work; while the recollection of my lifework has passed from me and I seldom recall anything in connection with it. I am a hard working student of Irish history, and am learning something new every day. As I have become exceedingly deaf I have few interruptions and yet derive a good deal of pleasure from life with myself as the closest companion. I will be in a short time in my eighty-sixth year and have every cause to be exceedingly thankful for many blessings. Give my kindest regards to any of your older members who may remember me when I was not an old fossil as at present.

Yours truly,

THOS. ADDIS EMMET.

New York, Feb. 13, 1913.

Dear Dr. Ward:

I am very sorry that an old engagement prevents my being present at the meeting the fourteenth.

My long association with the Obstetrical Society and the many kindnesses I have received at its hands, makes me feel under obligation toward it in many ways. When one looks back to the work which this Society has initiated, and which has been accomplished under its auspices, one feels that it occupies a place in American obstetrics and surgery fully equal to that of any other organization in this country. I will ask you as a contribution to your proceedings to allow from me a tribute to Dr. Josiah C. Nott, one of the founders of the organization.

Sincerely yours,

W. M. POLK.

The President introduced DR. ABRAHAM JACOBI as follows:

When I tell you that I am going to present the Nestor of the profession, I need not tell you his name. He has been honored with the highest that can be given to any physician, the highest honors that the profession has to bestow in this country as well as abroad, and it is doubtful if we can add to them. This Society honors him as one of its living founders. We hope he will tell us something of the men who were with him in those days.

DR. JACOBI.—It is a privilege to speak to you and I will try to give you something that comes to my memory. We have had a number of obituaries, but I shall not add my own. I will give you just a few points in connection with a few of these men of whom you have heard so much this evening. One point in the life of Thomas. He was a Southerner. You may remember, some of you, that we had a civil war with all the spite and jealousy that comes with the differences of two sides. Thomas had come here I think from South Carolina. He was a professional man and never emphasized his politics. At the time of the war he was secretary of the New York Academy of Medicine. In the bitterness of feeling of the time the position was taken away from him. It is well worth while to re-

member that as part of the history of the time. There was Sims. May I mention that he came here in 1856 and spent most of his life here, excepting the period when he was in Paris and London. At first he was not liked and was not welcomed in New York, but he was honored by the physicians abroad, and they welcomed him with all their hearts, and I know that he was liked by men who were not even citizens at that time. May I mention here a name that was somewhat known at the time when this Society was formed? We all know him now, and we know that it was retarded justice when they erected a monument over his bones. That was Semmelweiss. In 1861 he wrote a book on puerperal fever, and only two years after that time he began to fail and in 1865 he died in a lunatic asylum. He met with persecution from the profession, and was in a constant fight over his doctrines, and died insane. There was Charles Budd. He died young. I was very intimate with him. In 1860 he came to me, sent by the faculty to offer me the chair on Diseases of Children in the New York Medical College. I declined. Why? I had not been in practice so long that I could take a place in the faculty I thought. He grew eloquent in his efforts to induce me to take it. Then there was Dr. George T. Elliott. You have seen his gentle face this evening. He made a trip to Europe in 1858 where he was received with honors. He it was that introduced to American surgeons the method of subcutaneous injections. I thank you, gentlemen, and I will make room for more eloquent speakers.

DR. W. S. STONE, read an address on the early work of the Society. (To be published in full later.)

DR. J. RIDDLE GOFFE read an address on the men of the early days of the Society, and reviewed the methods then in vogue, dwelling particularly on the remarkable work done in the elimination of puerperal septicemia. (This paper will be published in full later.)

The President then introduced DR. J. WHITRIDGE WILLIAMS, of Baltimore.

DR. WILLIAMS.—I count it a great honor to be present on this occasion and to be invited to speak at this dinner. Your chairman simply calls upon me to "shine," but as I am not luminous that will be a difficult task. Indeed, I do not know whether it is more embarrassing to be given a text for one's remarks or not, for in either event I always wish when I have finished that it had been the other way. In this connection, I might mention an alarming experience which I had at a dinner in Scotland. Upon looking over the program I was startled to see that I was scheduled to propose a toast to the "chairman and croupiers," and immediately lost my appetite. To propose a toast to the chairman was simple enough, as I knew him well, but I was puzzled to know who and what the croupiers were. In my innocence I had always associated them with gambling, and imagined that they were individuals who sat at the end of the table and with a long rake-like appliance either pushed money toward the players or more usually drew it toward themselves. I saw no signs of such an arrangement and found it difficult to reconcile such associates

with the chairman, who was a virtuous and God-fearing gentleman. Finally, in desperation I sought aid from my neighbor and was greatly relieved to find that the term was applied to the gentlemen who sat at the free ends of a "U" shaped table. When I had identified them with the end men of the negro minstrels, my task was easy, and the reputation of the chairman was saved.

It has given me the keenest pleasure to come here and to hear the talks and to see the pictures of your former great men. I remember most of them except Sims, and am under personal obligations to many. I shall never forget the courteous kindness shown me by Dr. Thomas, whom I met shortly after graduating in medicine; and his treatment of me—then an ignorant boy—has been an example to me to dealing with young men.

Indeed you have a glorious heritage in the famous earl members of this Society, and it will be difficult if not impossible, for those of the present generation to live up to the standards set by them. In those days the soil was virgin and discoveries were waiting for the earnest worker. At the present time young men, and those who still feel that they are young, can scarcely expect to solve fundamental problems or to revolutionize gynecology as did our predecessors; but, nevertheless there is still an opportunity for well trained men of intelligence and industry to make discoveries upon which our future work will be based. Such discoveries, however, will not be made exclusively in the hospital operating room, but rather in the laboratories of chemistry, physiology, pathology and experimental medicine and by the patient adaptation of the results there obtained to accurate clinical observations. The field for such work is almost unlimited. Thus, we are practically as ignorant concerning the significance of menstruation and the causes of dysmenorrhea, as were Adam and Eve's first children. We know almost nothing of the fundamental facts of obstetrics, and have scarcely advanced beyond Naegele in our knowledge of the mechanism of labor. We are quite ignorant of the cause of labor, and as yet can only say that it usually occurs at the time appointed by the grace of God. We are just beginning to recognize that the toxemias and eclampsias are not due to the state of the moon, and are absolutely ignorant concerning the etiological factors concerned in the production of the simplest tumor—to say nothing of the malignant growths. Surely, the field is still open to those who are willing to relax to some extent the strenuous "chase after the dollar" and are anxious to add their little mite to science.

Notwithstanding my article of last year, in which I showed that in this country obstetrics is the most neglected of the fundamental branches of medicine, I have great faith in its ultimately reaching its proper plane. But that day will not come until every University Medical School possesses a suitable and properly equipped Woman's Clinic under the control of a conscientious professor, who is prepared to devote his energies to the care of hospital patients, teaching and research, instead of regarding the post as an opportunity for his personal aggrandizement.

I rejoice that you have made a beginning along these lines in New

York, which at present possesses the only suitably equipped clinic in the entire country.

I cannot avoid feeling that a part at least of this backwardness may be due to the name under which some of us labor. Recently, I read the life of Thomas Denman and was surprised to learn that as late as the end of the eighteenth century he was contemptuously referred to as a man-midwife. Is it not surprising that a man so designated was able to accomplish creditable work? But Denman was a great man. Think of it—a man-midwife! What could be worse, for even in New York, with its plans for education and registration, a midwife is regarded as occupying the lowest extremity of the social scale, and a man-midwife must be still worse. In Great Britain, and to a less extent in this country, the entire subject is designated as midwifery. With such a name but little can be expected; while to speak of the “science of midwifery” appears to involve a contraindication of terms.

I object almost as much to the designation “accoucheur.” Did you ever consider what it means? The term is derived from “accoucher”—to put to bed, so that the accoucheur is literally a putter to bed of women. Can you expect science to be advanced by men who are willing to allow themselves to be so designated?

Passing to the terms currently employed in this country—obstetrics and obstetricians. Have you ever thought that they are mere eupheisms? The former is derived from the latin term “obstetrix,” which means a midwife, so that obstetrics is merely midwifery latinized. If we study the development of the term, we find that it is derived from the verb “obstare”—to stand before. Consequently, the obstetrician is a stander before women, a mere looker-on, and it would be asking almost too much to expect one so occupied to be a scientific man.

Midwife, man-midwife, accoucheur, obstetrician! A choice collection of appellations. Possibly, the last sounds better for the reason that most people do not know what it means or how to spell it. Many of us have to stop each time we write the word, and I am certain if we go back to our student note-books that most of us will find that we spelled it incorrectly. I consider that such terms are handicaps and are derogatory of an important department of medicine, and that it is difficult to expect one to be proud of one's work, when one feels demeaned each time that is mentioned.

I hope to live to see the day when the term obstetrics will disappear and will be swallowed up in gynecology. The latter means the science of women, and is a broad and dignified term, which should include not only the anatomy, physiology and pathology of the generative tract, but everything—mental and physical—directly dependent upon the existence of the female sex. Obstetrics is a branch of the broader gynecology, and I hope that the day will soon come when this is realized, and a band of scientific men will be developed who will recognize that gynecology means much more than the mere ability to use a knife, a pair of scissors and a needle and thread.



The President then introduced Dr. EDWARD REYNOLDS of Boston, who spoke as follows:

"This is the celebration of the beginning of Gynecology in American medicine, for the birth of this Society in New York represented the commencement of that epoch. I value and appreciate the honor and privilege of being here and representing Boston. When I was asked to come I was told that by the time I spoke the members would have heard all that they would care to hear, probably, about the Society, and I was requested to confine myself to some side track, and while that may be difficult I will attempt to carry it out. At the semicentennial celebration of the Boston Obstetrical Society we had the advantage of listening to an interesting account by an active member of the Society who had been in the enjoyment of a large practice at the time the Society was founded, and his account of his work was still clear. It was curious to hear of the methods by which most of the members of the Society and in fact most of the world had been delivered. I cannot speak of the methods used when this Society was founded for at that time I had had but a single obstetrical experience. Of the advances that have been made the greater part have occurred during the last half of its existence, and this is especially true of the other branch, gynecology. Of this I am qualified to speak for I began my professional life at about that period as the assistant of Dr. John Homans. We did very little abdominal surgery except for ovarian tumors, which came usually only when they were of great size. We operated under carbolic spray, and the hands of the operator and assistants were passed through a solution of one to forty carbolic. The tumors were large, universally adherent, the dissection was done with knife and scissors, and every bleeding point clasped and tied with silk, which had been laid in one to forty carbolic. Operations lasted from three to four hours, and the convalescence was horrible. Dr. Homans completed his first one hundred ovariectomies with a loss of only ten, a very good result even for our day in such cases. I well remember the publication of Fitz's epoch-making paper on appendicitis. A few days after I read it I was called to a case of a woman with a severe pain in the abdomen. I knew nothing about it and asked them to take her into the Massachusetts Hospital. Fitz diagnosed the case as a periappendiceal abscess and she was operated on and cured. It is noteworthy that they did not in those days do more than bring the pus up from about the appendix. It is certainly curious when a man who is just over fifty reflects that all the procedures with the exception of plastic surgery which are his daily experience and by which he is earning his daily bread, have been perfected since he entered practice. It looks now as though the medical side of the profession were looking forward to its greatest achievements. There are many new and startling details of procedure coming, nevertheless it seems improbable that the future will be able to show the startling changes that have attended the last half of the existence of your Society."

Portraits of the founders and early members of the Society were then shown on a screen and responses made in each case by mem-

bers of the Society. These brief commemorative addresses were as follows:

THOMAS F. COCK.

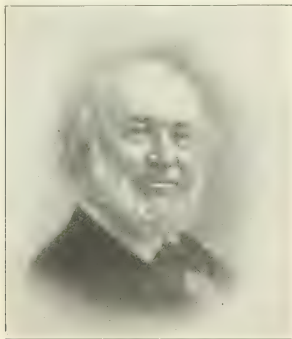
BY

DR. BACHE McE. EMMETT.

DR. THOMAS F. COCK was, in the period of his active life, one of the best-known physicians in New York.

He studied medicine in company with Valentine Mott in the office of Dr. Valentine Seaman.

During the epidemic of yellow fever in 1822 he was untiring in his efforts to overcome the disease and, again, during the cholera of 1832, his devotion was such that the city authorities honored him with the presentation of a silver service.



THOMAS F. COCK, M. D.

He was visiting physician to the New York Hospital from 1819 until 1834 and consulting physician after that year; Vice-President of the College of Physicians and Surgeons from 1827 until 1855; its President from that year until 1858, and President of the Academy of Medicine in 1862.

Besides being elected the first President of the New York Obstetrical Society, he was connected with all the other prominent medical societies in New York.

He was deservedly eminent in his profession and fully entitled to the highest respect for his estimable qualities as a man. He was genial, kind-hearted and companionable.

## J. MARION SIMS.

BY

DR. CLEMENT CLEVELAND.

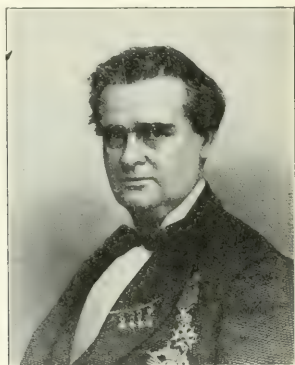
THE father of gynecology.

Marvelously gifted with that intuitive and creative faculty called genius.

He invented the duck-bill speculum, the "Sims" speculum, and the silver wire suture. With these he succeeded in curing vesico-vaginal fistulæ.

His methods revolutionized the surgery of that day and led to the present advancement in modern gynecology.

A man of persistent energy and perseverance.



J. MARION SIMS, M. D.

Against great opposition he founded the Woman's Hospital, the first hospital in the world devoted to the diseases peculiar to women.

He operated before distinguished surgeons in London, Paris, Dublin, Brussels and other European cities with unfailing success.

A Knight of the Legion of Honor.

Decorated by Spain and Portugal and twice by Italy.

A member of learned societies of London, Edinburgh, Brussels, Berlin, Christiania and other foreign capitals and many of the state societies of our own country.

He wrote many papers on different subjects. A short while before his death he wrote, "The Story of My Life."

He was surgeon in chief of the Anglo-American ambulance corps in the Franco-Prussian war.

He was president of the American Medical Association and of the American Gynecological Society.

He was a man of great beauty of features, which are shown in enduring bronze in the statue in Bryant Park.

In disposition, he was genial, amiable and lovable.  
His energy and devotion to work seemed inexhaustible.  
His renown was world-wide.  
He is one of the immortals.

T. GAILLARD THOMAS.

BY

DR. CLEMENT CLEVELAND.

COMING to New York a poor boy without influence, he became one of the most eminent men in our profession.

Professor of obstetrics in the College of Physicians and Surgeons and later professor of diseases of women.



T. GAILLARD THOMAS, M. D.

As a clinical lecturer he had no equal. He was clear, impressive and persuasive. His clinics were the most popular of the day, always crowded, not only by students, but by practitioners.

He was a great orator and delivered many famous addresses.

His voice was one of great richness and power.

He was a devoted student of English literature and the methods of the best masters. He was a man of great culture.

His choice of words was remarkable. His diction was captivating.

As a writer he was fluent, but always exact. He wrote many papers on obstetrical and gynecological subjects.

His work on the diseases of women was the most complete of the time, went through six editions, had an enormous sale, and was translated into twelve different languages. It was a classic and made his reputation as a gynecologist of the first rank.

As a diagnostician he was the peer of any.

As a teacher he had no superior.

As an orator he was most brilliant.

As an operator he was bold, but not reckless, rapid in his movements, inventive, resourceful in complications. As a laparotomist he had no superior.

He was a member of the leading obstetrical societies of this and foreign countries.

He was a man of pleasing personality, affable and enthusiastic, full of energy and perseverance.

The great dinner on the occasion of his seventieth birthday, was the largest ever given to any medical man, and attested the esteem in which he was held by the profession.

He was a born leader of men.

In any walk of life he would have been among the first.

He was a gentleman in the true sense of the word, beloved friend, teacher and master.

### EDMUND R. PEASLEE.

BY

DR. BACHE McE. EMMETT.

I rise again with great pleasure to speak of a man of such prominence in the medical profession as Dr. Edmund R. Peaslee. It is to be regretted that such a brief time is allowed for the sketch, and so I can mention only a few of the salient points in his career.



EDMUND R. PEASLEE, M. D.

He was born in 1814 and died in 1878, aged sixty-four years. He was a graduate of Dartmouth, 1836, and of the Medical Department of Yale, 1840.

The next year he was elected Professor of Anatomy and Physiology in Dartmouth, succeeding Dr. Oliver Wendell Holmes. This chair he occupied until 1871 and was then transferred to that of gynecology.

He moved to New York in 1858 and soon established a wide reputation as a gynecologist. During the Civil War he was surgeon to the New England Hospital, New York City, and to the New York State Hospital.

He was at one time Surgeon to the Woman's Hospital, also President of this Society, President of the New York Academy of Medicine and, at his death, of the American Gynecological Society, of which he was also a founder.

Apart from numerous monographs from his pen, he was author of a work on ovarian tumors, published in 1872. He is credited with performing the first successful laparotomy for removal of ovarian tumor in New England and he was the first to propose and practise flushing the abdominal cavity after laparotomy.

Dr. Peaslee justly ranked high among his fellowmen. He was recognized as a teacher of noble aspirations and lofty ideals. He was a man of the highest type of culture, of ripe scholarship and knew his subject thoroughly. He was of clear understanding, sound in argument, and his power of expression was striking, direct, modest and convincing.

## JOSIAH C. NOTT.

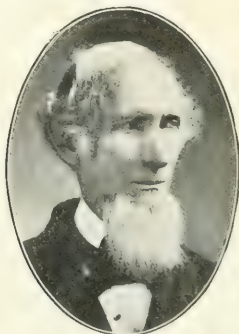
BY

DR. WILLIAM M. POLK.

DR. JOSIAH C. NOTT, one of the founders of this organization and during his life time one of its most conspicuous members, was born in South Carolina, graduated in medicine at the University of Pennsylvania, settled in Mobile, Alabama, where with the exception of a year or two he carried on work which marked him as one of the most brilliant surgeons of the Southern States. He belonged to the same period as Gross, Paul Eve and Warren Stone, and ranked with them in all professional attainments and beyond them in scientific attainments outside of medicine and surgery, for he was an active member of the Anthropological Society and carried on his studies in this subject with Glidden. In the pre-Darwinian period the work which he and Glidden published in their volume known as "Types of Mankind," held a high place among anthropologists. He lived long enough to see these views upset by Darwin himself, as in his *Origin of Species* and the *Descent of Man*. This is an evolution with which Nott was familiar, but with whose starting-point he had differed; for his "types of mankind" were really based upon separate centers of anthropoid creation. He was broad enough however to accept to the full all of Darwin's views and conclusions. Just here let me say he was in much closer touch with Wallace than with Darwin upon this whole question of evolution, and as with many others



looked really upon Wallace as preceding Darwin in the correct conception of the doctrine of evolution. In 1848 Dr. Nott made observations upon the mosquito as the conveyer of yellow fever and published his conclusions in the Southern Surgical Journal of that year. He believed the mosquito was the agent of propagation and so states in this article. At the close of the Civil War Dr. Nott came first to Baltimore and there failing to meet with conditions that appealed to him moved thence to New York. Here he became closely affiliated with Marion Sims, John T. Metcalfe and T. Gallard Thomas. He continued this affiliation, which ripened into close friendship with each of the three, until the time of his death, which occurred in 1873. After coming here he devoted himself wholly to gynecological surgery. I had the honor of being associated with him in several undertakings and had the opportunity to learn how fully possessed he was of the qualities that enter into the best type of gynecologist, and the highest type of manhood. One of his lesser pieces of work was some research as to the difference in the effect of carbolic acid and tincture of iodine upon the uterine mucosa;



JOSIAH C. NOTT, M. D.

and some of the conclusions which he then reached related to the penetrative and antiseptic effects of iodine as distinct from the more corrosive and less penetrating action of carbolic acid; bearing upon the surface applications of iodine now made for sterilizing the skin, preparatory to incision.

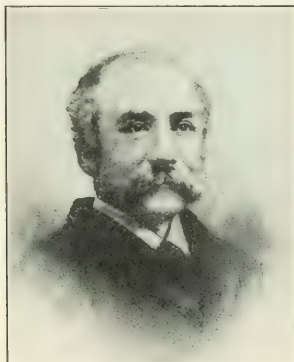
This short sketch covers I presume the space allotted in the entertainment for which I prepared it, and I beg you will accept it as a small tribute of admiration and affection to a man who in the writer's estimation fulfilled as completely as any one he ever met, the place which belongs to the highest type of physician, surgeon and man.

## THOMAS ADDIS EMMETT.

BY

DR. J. RIDDLE GOFFE.

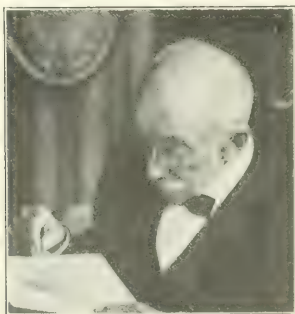
WE are all so familiar with the successful life of Dr. Emmet, and he has been for so many years among us, and so kindly to us all that feel that we are speaking of an old friend. He was born in 1825, and received his education in Vicksburg, where he was brought up under the influences of the university, and had the advantages and benefits of a higher education. He received his medical training at the Jefferson College and then came to New York where he served in the hospitals for a number of years. His professional life was spent in this city and he was working on the lower East side when Dr.



THOMAS ADDIS EMMETT, M. D.

J. Marion Sims came to New York. They soon met and became intimate friends and professional co-workers. Dr. Emmet assisted Dr. Sims in his efforts to establish the Woman's Hospital, which was organized with the aid of five prominent women, and the hospital was opened on Madison Avenue, New York. This building later became the home of Dr. Emmet. Like all great innovations the work of Dr. Sims was not appreciated, and his operation for the cure of vesicovaginal fistula was not looked upon with favor. Dr. Sims succeeded in establishing his hospital in 1853 and Dr. Emmet was his house physician. Dr. Sims was a great genius; he looked into the future, suggested new ideas—he was full of ideas. Dr. Emmet accepted him as his instructor, but Dr. Emmet was the man who did the work. Dr. Sims did not have the patience to become a first-class operator, his technic was not of the highest order. Dr. Emmet was the man who looked into the details and worked out the problems. The Woman's Hospital was founded, as you all

know, for the treating of vesicovaginal fistula, and it was while engaged in that work that Dr. Emmet learned that so many terrible conditions were the result of laceration of the cervix, and he devised the operation of trachelorrhaphy for its repair. He believed that this condition influenced the nervous system of women and was important and insisted upon the necessity for its repair. He studied the floor of the pelvis and attracted more attention to its anatomy. His lasting fame rests upon his operation for laceration of the cervix, and he later introduced the operation for amputation of the cervix. His book was founded upon the careful notes he took of his cases, and his own statistics and when it was published it was received with acclaim by the profession, and many of his theories



THOMAS ADDIS EMMETT, M. D.

have stood the test of time. At that time he was the great leader of gynecology, a great student, recognized for his skill by the world. We are glad he has lived, that time does not hang heavily upon his hands, and we are sorry that he is not with us to-night.

### ABRAHAM JACOBI.

BY

DR. FRANCIS FOERSTER.

THERE are songs without words because they do not need any, why should there not be pictures without words? The picture before us surely does not need any words of explanation. Why, this is Abraham Jacobi, one grand old man everybody the wide world over knows him. Now, like in the case of the celebrated Wilson, I may say: Jacobi, that's all. But would it not be a pity to discontinue so abruptly such an interesting subject?

Many years ago a modest young man of twenty-three arrived at these shores in quest of a home which his own nation and country had denied him. He brought with him the blasted hopes of a phantastic youth and the strong determination to be done once and forever with the chasing of specters and to devote himself heart and soul to the advancement of science in this his country of adoption. Thus was borne unto Columbia one of her most noble sons. Sixty years and more have passed, the young man of then, to-day a venerable man over eighty, we have the great pleasure of seeing hale and hearty in our midst to-night. Years and years of earnest toil and strenuous professional life lie behind him. A full acknowledgement of his labors has come to him in the gratitude of the people and the many expressions of highest esteem of his confidants.

He has become a recognized leader among men. Long ago he has outgrown the narrow confines of even this great country, his name and fame have become universal.

Gentlemen: It is not for me to tell you how Abraham Jacobi has spent his long and useful life which Providence was so kind to give him, history will take care of this. True to the lofty ideas he



ABRAHAM JACOBI, M. D.

holds of medicine he has never missed an opportunity to elevate our calling and to promote the development of medicine in all its various branches for the highest good of the profession and humanity. In words and deeds throughout his life he has shown what one man *can* do, verily a glorious example for every one to follow. May Fate continue to favor him with good health and spirits for many years to come.

To the Nestor of the American medical profession, Dr. A. Jacobi: long may he live!

## NATHAN BOZEMAN.

BY

DR. MALCOLM McLEAN.

DR. NATHAN BOZEMAN was for a long period an active worker in gynecology and contributed many papers during his professional activity.

As early as 1856 he was developing the operations for vesico-vaginal fistula.

His name is familiarly associated with his method of suturing by "button" or "shot suture."

In 1882 he reported a case in which he removed a "Cyst of the Pancreas" which weighed twenty and one-half pounds.

Dr. Bozeman lived out his four score years and left his name listed among the "worthies of our art."



NATHAN BOZEMAN, M. D.

## FORDYCE BARKER.

BY

DR. HENRY C. COE.

FORDYCE BARKER, loving and lovable, of regal presence, with the "heart of a lion and the hand of a woman."

Born in 1818, he rested from his labors at the age of seventy-three, working until the end.

It was my great privilege to enjoy his confidence and affection from the beginning of my professional career, and to look upon him with almost filial reverence. There are few in this audience who can recall his charming personality, his forceful speech, which was

not even impaired by his husky voice, due to partial paralysis of the vocal chords.

Dr. Barker was not a student, or an accurate scientific observer, according to modern standards. He never operated, but was essentially a "medical gynecologist." Many of his views, especially his negative of well-recognized puerperal lesions, would seem strange to the present generation, though he was a skilled obstetrician in his day. He was always a general practitioner, and a most successful one, for he possessed in the highest degree tact and profound knowledge of human nature, and the power of inspiring absolute confidence—natural gifts, without which the best-equipped physician never enters the circle of immortals.

As a host Dr. Barker was without a peer. He was at his ease in any assemblage, and "where he sat, there was the head of the table."



FORDYCE BARKER, M. D.

Had he been a foreign subject he would have been ennobled, but no patent of nobility could be added to his distinction. I need not rehearse the reward showered upon "that great child of honor." Five times the degree of LL. D. was conferred upon him here and abroad, while the list of foreign societies of which he was an honorary member was long and brilliant. He was the first President of the American Gynecological Society and the only one ever reelected to that high office. Dr. Barker had a fine and cultivated taste in art and was intimate with literary and scientific men here in America and Europe. He had a sweet, gentle nature, unembittered by his various experiences with life. There have been many who have left more endearing monuments of scientific achievement, but none whose memory is more fragrant. I love to think of him "that good gray head which all men knew," as one whose heart was like that of a little child. We are told that "of such is the Kingdom of Heaven."



## EMIL NOEGGERATH.

BY

DR. MALCOLM McLEAN.

For many years Dr. Emil Noeggerath was a conspicuous contributor to the practice and study of our art.

He made a special research in the study of "Latent Gonorrhea in Women and its Effect upon Fertility," which was one of his most important works.

He also presented a paper on the "Diseases of the Blood-vessels of the Ovaries and Their Relations to the Development of Ovarian Cysts."

His name must go down on the list of the prominent workers of our profession.



EMIL NOEGGERATH, M. D.

## PAUL F. MUNDÉ.

BY

DR. MATTHEW D. MANN.

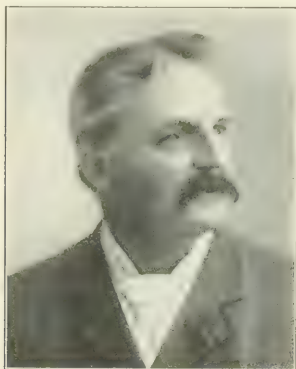
My remarks will have to be entirely extemporaneous, as I did not know I was to speak until I came into the room. I cannot let this occasion go by without expressing the great pleasure I have in being with you this evening.

Dr. Mundé came to this country when three years of age. His father was a physician. He was educated and received his degree at Harvard, after which he went to Europe and studied with Scanzoni and other eminent European gynecologists. He was abroad during the period of the war between Austria and Germany, and served in the hospitals, and later served in hospital work in the war

between France and Germany. He was the recipient of the decoration of the Iron Cross, but he never spoke of it.

When he came to New York, he had had a very good training, having imbibed all that was known of gynecology in Germany at that time. Besides his general education was excellent. He was able to read German fluently, and translated many papers, thus spreading a knowledge of German ideas and increasing German influence. One of his greatest efforts was in editing the *AMERICAN JOURNAL OF OBSTETRICS*, which he did with skill and good judgment.

He had a great influence as secretary of this Society, and I do not believe that any man ever did more for it. He edited the *Transactions* for many years. He wrote many books—all good,



PAUL F. MUNDÉ, M. D.

some excellent, his last effort being the re-editing of Dr. Thomas' *Gynecology*. The combination was not a good one, and the result was not a great success. They did not seem to work well together. Dr. Mundé was a very good operator. I assisted him with his first ovariectomy, and he helped me with my first; that being the only indication for laparotomy at that time, we had all of our instruments in common, and we borrowed from each other.

Dr. Mundé was a splendid writer, a man of high ideals of honor in the profession, and a man we can all look up to. I am sure that the Society owes to him a deep debt of gratitude for what he did in its behalf.

## ALEXANDER J. C. SKENE.

BY

DR. R. L. DICKINSON.

DR. SKENE was a striking example of the fact that genius is the infinite capacity not only for taking pains but for hard work. Two days before he died he saw sixty patients. For endurance only Dr. Fowler and Dr. Jewett, in our borough, have been comparable with him. His chest girth was 44 inches, and he was a *rara avis* in that the hat of Dr. Jacobi fitted him and would not fall down to his shoulders.

Few men concealed more generous deeds. Strong in his likes and dislikes, tenacious of purpose, keen of insight, full of apt anecdote, tactful, discreet, hopeful, inspiring, his impress was strong on those about him. Indeed, throughout all his life runs this personality



ALEXANDER J. C. SKENE, M. D.

and force that make greatness. Character escapes characterization. Personal magnetism eludes biographies. The impress of vigor and simplicity, the attraction of kindliness and heartiness—these things each of us who has spoken tonight has sought to put into words. But the aroma, the radiance, the vitality, the magnetism, somehow, evaporate in the telling. Whether it be in this minute of tribute or in a whole volume of detail—somehow these essentials escape and the stranger is forced to admit that he cannot quite see all the charm that friends and followers dwell upon so strongly. None the less, for these friends and followers, the love and devotion such men inspire follow after them.

The surgeons say to us that there was need that the pioneer—the great man in gynecology—should develop this important new specialty. Now that it is “completed” they tell us we can take it over, complete. These present every-day methods of ours were the invention, the study, the product of immense thought and toil on the part of the men whose pictures are passing before us to-night. And not the least among these men in fertility, in originality, in devotion, was Alexander Johnston Chalmers Skene.

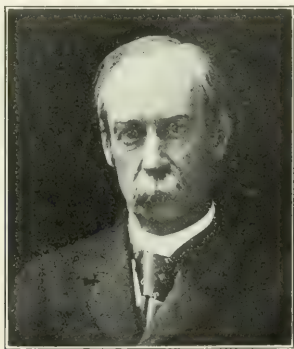
## WILLIAM THURSTON LUSK.

BY

DR. HENRY C. COE.

“GREATER love hath no man than this, that a man lay down his life for his friend.” This very week our hearts have been thrilled by the story of how that little company of brave men exemplified these words. Surely no nobler epitaph could be inserted upon the icy cairn which covers the heroes of the Antarctic.

A few days ago I read them upon a modest headstone in our silent city. It was in the gloaming of a stormy winter's day and my own



WILLIAM THURSTON LUSK, M. D.

mood was in accord with the environment. I had never visited that lonely grave before, but I knew whose name I would find upon the other side—William Thurston Lusk.

Nearly sixteen years have passed, dear friend, since I heard your gentle voice and looked into those kindly eyes, which have long gazed upon the Eternal Morning, but your memory is just as fresh,

just as sweet, as if it were yesterday. A week before my chance visit to his last resting place, a company of old Bellevue men gathered in the familiar halls and sat around the board, which the care of his sons has preserved unchanged, just as he left them. His presence pervaded the company. It seems as if an empty chair was kept for him. In every speech there was an affectionate reference to the lost teacher and friend. How soon our wisest and noblest are forgotten in this great city! A leaf drops into a deep mountain pool; there is a slight ripple; then all is calm and still. Even so you and I pass and hardly a ripple stirs the busy world. What then must have been



DR. LUSK IN THE AMPHITHEATER AT BELLEVUE.

the personality of this man, who, after so many years "Though dead, yet speaketh!"

I shall not call to your remembrance Dr. Lusk's writings, his earnest and forceful teaching, his many honors. You know all that. Judged by present standards, he was temperamentally unfit to be a successful surgeon, though possessed by marvelous intuition and dexterity as an obstetrician. I know no man who was more honest with himself and the world and this I believe was the secret of his undying influence. Every error in judgment or technic, every accident or unfortunate result, was boldly and frankly published by him, in order that others might profit by his experience. It seems to me that there is a personal message in his life for our younger

brothers. Your books, your discoveries, your reputation, your money all are ephemeral. Would you not rather be judged hereafter as we judge him? Would you not rather wish that men should say you of as they do whenever his name is mentioned: "He was a Christian gentleman?"

### JAMES B. HUNTER.

BY

DR. GEO. W. JARMAN.

DR. HUNTER is not dead; his influence is still alive among the people throughout the country. He was a most progressive man, and probably the first to adopt the plans of Lister in his work



JAMES B. HUNTER, M.D.

in the New York Cancer Hospital, and in the Woman's Hospital. He did an enormous amount of work in studies of cancer of the uterus. Those of you who knew him will remember him as a stern, solemn, lonely man, but his influence over his patients in the hospital was wonderful. Many a time have I seen him walk into the wards, erect, and stately, and noticed the feeling of confidence that would seem to come over his patients, which was one of the most beautiful things in his life. He was the true type of physician.

### CHARLES CARROLL LEE.

BY

DR. CLEMENT CLEVELAND.

DR. CHARLES CARROLL LEE was the grandson of Charles Carroll, of Carrollton, one of the signers of the Declaration of Independence. He came to this city a poor man, rose to distinction as a surgeon in



the Woman's Hospital, and became a Professor in the Post-Graduate Medical School. He was for many years the assistant of Dr. Emmet, and later became attending surgeon. I cannot recall very much of his social life at this moment as my association with him was chiefly



CHARLES CARROLL LEE, M. D.

at the Woman's Hospital. He had a large general practice, and was an able gynecologist. I am sure we all have a warm feeling for this man; he had a noble character. He died from an infected wound, which he received in the work in which he had set out to make a reputation. I am sure he would have become one of our most noted gynecologists, had he not met with this accident.

## TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

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*Meeting of February 6, 1913.*

*The President, GEORGE M. BOYD, M. D., in the Chair.*

The subject chosen for consideration was

### HEMORRHAGE FROM THE NONPREGNANT UTERUS.

DR. GEO. W. OUTERBRIDGE. *The Pathology.*—There is probably no chapter in the whole field of gynecology that has been, and still is, so much of a puzzle both to the clinician and pathologist as that dealing with hemorrhage from the nonpregnant uterus, unassociated with gross morbid pathology. As the time is limited, and you are anxious to hear the clinical papers which are to follow, I shall limit my remarks to a brief résumé of some of the ideas that have been advanced to explain these menorrhagias and metrorrhagias, occurring especially about the time of puberty and the menopause, not due to tumor-formation or malignant disease of the uterus, or to inflammatory conditions of the adnexa. The fact that practically every structure of both the myometrium and the endometrium has at some time or other been held responsible is of itself good evidence that the pathological anatomist has not as yet been able to put his finger on the real seat of the trouble.

It seems of course natural to blame the endometrium, for this is apparently the point from which the hemorrhage could most easily come. I was rather surprised to find in the new edition of Veit's *Handbuch* the statement that endometritis is the most frequent and the most important cause of menorrhagia. That is a statement with which I can hardly agree, and which I think scarcely expresses the modern point of view. This brings up at once the question of what we mean by "endometritis." Anyone who makes the statement that this is the commonest cause of menorrhagia is I am sure holding to the older view, according to which the normal endometrium is a structure consisting of a rather cellular stroma, throughout which are placed at fairly regular intervals straight or but slightly wavy tubular glands, lined by a single layer of columnar epithelium, and containing no secretion, the distance between the glands corresponding to about four or five times their diameter; any deviation from this more or less arbitrary scheme representing a pathological condition, immediately put down as endometritis. A few years ago, however, Hitchman and Adler showed us that many of the changes in the endometrium which had formerly passed as "hypertrophic" or "hyperplastic glandular endometritis" are merely physiological

changes in the normal endometrium incident to the various phases of the menstrual cycle. They showed that the great increase in diameter and length of the glands, with consequent increased tortuosity and closer approach of the glands to each other, the projection into their lumina of almost papillary processes, the filling of the gland lumina with secretion, the edema and decidua-like changes in the stroma, are all merely expressions of the physiological activity of the tissue, and occur in every normal endometrium during each premenstrual period. That an almost identical hyperplasia of the endometrium can occur, under some circumstances, outside of the premenstrual period, and that such a hyperplastic condition is quite frequently found associated with uterine hemorrhage, cannot be denied, but to say that it is a true endometritis, and that it is the cause of the hemorrhage, is a very different matter. It seems to me more probable that the hyperplasia often found in connection with menorrhagias and metrorrhagias is to be looked upon rather as the result than as the cause of the condition—that the endometrium in these cases never has a chance to undergo thorough involution after one hemorrhage, before another, with its attendant hyperemia, comes on, the endometrium being thus kept in a constant state of hyperactivity. The fact, moreover, that this chronic condition of hyperplasia of the endometrium is found at times unassociated with uterine hemorrhage, and that in many cases of hemorrhage it is entirely lacking, shows that it cannot be considered the true cause.

A few years ago, Dr. Norris of this society described a type of endometritis which he found in two cases of severe hemorrhage, and which he called "interstitial endometritis, with angiogenesis and angiorrhaxis." The histologic picture in these cases was that of a somewhat thickened endometrium, with comparatively few glands, but with very numerous markedly dilated and congested capillary blood-vessels, some of which had ruptured, with resulting formation of small hematmata throughout the stroma. In addition, both of these cases showed an infiltration of the stroma with round cells, leukocytes, and plasma cells—in other words, an endometritis in the modern conception of a true *inflammation* was present. But even in these cases I believe that the endometritis was a mere coincidence, and not an essential feature in the production of the hemorrhage, for only this morning I was examining some sections of endometrium from a young girl of seventeen, who was curetted a couple of days ago on account of prolonged and severe hemorrhage. This tissue showed all the changes described by Dr. Norris, *minus the endometritis*. The glands were rather scanty, and showed no hyperplastic changes, but the blood-vessel formation in the stroma was very marked; in one place there was distinct rupture into a gland, with discharge of blood into the lumen. In no place, however, could the slightest evidence of inflammatory changes be found. Here again, the congestion of the endometrium must be considered the result and not the cause of the hemorrhage; in Dr. Norris' cases thorough and repeated curetings failed to check it, and hysterectomy had to be resorted to. In the case I refer to not sufficient time has elapsed

since the curetment to judge of its effect. That hemorrhage from the uterus is frequently associated with true endometritis of course no one will deny, but I think we must cast aside the idea that the endometritis *per se* is necessarily the cause.

Turning then to the myometrium, we find ourselves in an even more disputed field. What is the relation of the musculature, connective tissue, elastic tissue, blood-vessels, etc., to uterine hemorrhage? Away back in the sixties, Scanzoni came forward with his theory of "chronic metritis." This has always been, however, a poorly defined term, and the conception of just what it signifies has varied greatly among different authors. Perhaps the man who has gone most extensively into this question is Theilhaber; his theory is that hemorrhage is due not so much to an excess either of connective tissue or of muscle, as it is to a relative insufficiency of the latter, owing to a hypertrophy of the connective tissue, *plus* congestion of the blood-vessels. He claims to have demonstrated that the uterine wall undergoes normally a gradual change during the life of the woman with regard to the relative amounts of connective tissue and muscle, consisting up to about ten years of age of approximately one-third muscle and two-thirds connective tissue, the muscular tissue then gradually increasing, until by the age of twenty it forms two-thirds of the wall, and the connective tissue only one-third. This level is maintained, if no pregnancy occurs, until about the fortieth year; if pregnancy takes place, however, the proportion of muscle always shows a marked rise, but rapidly falls during the puerperium to a point a little lower than before. From the fortieth to the seventieth year there is a gradual retrogression of the muscle, so that by the latter period it again constitutes but one-third of the whole.

Theilhaber claims that the failure to discover a definite histologic picture associated with uterine hemorrhage has been due to the fact that pathologists have not taken this normal variation into account, and also that they have failed to realize the importance of the condition of the blood-vessels, his idea being that if at any time in life the connective tissue becomes excessive for that particular period, the uterus cannot contract and close the vessels as it should, one of the functions of the uterine muscle being to contract and compress the dilated and torn blood-vessels at the end of each menstrual period. If such contraction does not take place, the bleeding is prolonged, and soon goes over into a condition of menorrhagia or metrorrhagia. If the blood-vessels are small and not congested, a comparatively weak musculature will be sufficient to compress them and regulate the bleeding; if, however, the vessels are large and congested, a much more powerful action will be necessary, so that an amount of muscle tissue which in one case would be entirely sufficient would in another be insufficient, and it is to this *relative* muscular "insufficiency" that Theilhaber ascribes most of these cases of hemorrhage. Among the causes which may produce blood-vessel congestion he considers onanism, excessive venery, psychic disturbances, and high living the most important.

This theory is in many points very attractive, and appears exceedingly plausible, but it does not hold water from the anatomical point of view, as no one has been able to demonstrate, for any period of life, any constant relationship between the proportion of muscle to connective tissue present in the uterine wall and the occurrence or non-occurrence of hemorrhage. The most extensive researches into the subject from this point of view have been made by Pankow, who studied carefully over fifty uteri, all of which had been removed on account of uncontrollable hemorrhage. In no instance were inflammatory conditions, pregnancy, or tumors present; the specimens were from patients of varying ages and all degrees of parity, six being from nullipara. By careful comparison with sections from other uteri which had not shown any tendency to bleed excessively, Pankow was unable to discover any such relationship whatever, and these results have since been confirmed by Schickele, Anspach, and many others. The same thing holds true with regard to the elastic tissue and the condition of the blood-vessel walls—no characteristic changes of these which can be definitely associated with a hemorrhagic tendency have ever been discovered.

Of recent years, therefore, pathologists have been more and more driven to the idea that something outside the uterus must be responsible for these hemorrhages—some other organ, acting possibly by means of a "hormone" upon the uterine parenchyma. It is natural in this connection to think first of the ovary, whose internal secretion we now believe to be largely responsible for the occurrence of normal menstruation. The idea that the ovary, acting as a ductless gland, elaborates some such hormone, which has a powerful action upon the uterus, is becoming more and more plausible as the physiologists are showing us increasingly numerous functions which they believe to be possessed by this internal ovarian secretion. It would be far beyond the scope of the present discussion to go into any details regarding this work, but although it must be admitted that it is still in a decidedly experimental stage, and that no definite anatomical changes have been demonstrated in the ovaries in these cases any more than they have in the uterus, there are a few points which lend considerable weight to the ovarian theory. The occurrence of these hemorrhages chiefly at puberty and the menopause, periods at which the ovarian secretion may be supposed to be undergoing profound changes, and therefore to be irregular in action, is certainly suggestive, as is the well-known fact that they are almost invariably checked by castration. In the past few years further evidence along this line has been furnished by the discovery that x-rays, which are known to destroy the functional cells of the ovary, have a similar effect, and constitute a most efficient means of checking these often otherwise uncontrollable hemorrhages.

#### ATMOCAUSIS.

DR. BARTON COOKE HIRST.—In treating uterine hemorrhage we must admit that there is a small class of cases which cannot be dealt

with by the commoner plans of controlling uterine bleeding. Curetage, oöphorectomy, hysterectomy may not be applicable to a small class of cases, usually in middle-aged women. I dare say there is nobody of considerable experience here to-night who has not in mind examples of this sort. The first case of this sort which came to my notice some years ago will illustrate what I mean. A lady from New York City consulted me with the statement that she had been to three or four specialists in New York for uterine hemorrhage which was her most prominent symptom. She fell into the hands of a gentleman who had a predilection in favor of nephrorrhaphy and he insisted upon suspending her kidney in addition to a curetage, and she bled as before. Another specialist whose particular fad was suspension of the uterus carried out this treatment and incidentally curetted her and still she bled as much as ever. She went to two or three more surgeons by whom as many different operations were done and each time incidentally a curetage, but still she bled. She finally fell into the hands of a specialist educated in the German school of gynecologists. He stated to her that nothing was left but hysterectomy, unless she might be cured by atmocausis, the cauterization of the endometrium by live steam. When the patient quoted this statement to me it sounded reasonable, and I was chagrined to think that I had not the means of carrying out the treatment. I provided myself therefore with Pincus' apparatus for the cauterization of the endometrium with live steam, and applied it in this case with a cure, although the woman had been subjected to curetage a number of times without success. This treatment avoided the necessity of hysterectomy, left her unmutilated and cured her by a minor procedure without risk. Since that time some eight years ago I have had occasion to use this method of treatment on an average of about three times a year, and so far I have not had a case in which the treatment could be said to have failed completely. As an illustration of the sort of case in which this treatment is most often required, a patient applied to me who had been curetted by two prominent gynecologists. She had been bleeding for two years, was approaching the menopause, and curetage had been without effect. Careful examination showed nothing grossly wrong with the pelvic organs. The uterus was slightly enlarged, due probably to an old chronic metritis of a minor grade, but there was no neoplasm, no suspicion of malignancy. The only symptom was uncontrollable bleeding. She was subjected to atmocausis and was free from hemorrhage for six months. This was two years ago. She then returned to me. She was again curetted and had an application of live steam. The curettage removed only a few strips of very thin connective tissue. The endometrium had been almost completely destroyed. She was subjected to another application of atmocausis and permanent relief followed. This is about the history of the twenty odd cases under observation in the last eight years. I feel that this is a method of treating uncontrolled hemorrhage from the uterus not associated with neoplasms and malignancy which we cannot well afford to ignore. It is not often resorted to, but in the



cases in which it is suitable I do not know of anything which can take its place so well.

A word or two as to the technic of this application. I dare say that most of the members of the Society are familiar with the apparatus devised by Pincus of Germany. It consists of a copper boiler with a safety valve and thermometer. Attached to this is a strong tube of webbing and on the end of this is the implement for the introduction of steam into the uterine cavity. It is planned on the principle of a two-way catheter. The steam is projected through one little tube having ample space to return by another external tube and is led off into a bucket by a rubber tubing. The steam escapes at a point where it can do no one harm. The degree of heat is an essential factor. The temperature of the steam must be above  $100^{\circ}$  C. Pincus reports five interesting cases of hemophilia completely cured by this means. These were cases of young women in whom hysterectomy was not desirable. Five complete cures in these cases were secured by the application of steam at a temperature of  $115^{\circ}$  C., kept in contact with the endometrium for sixty seconds. Such an application destroys the endometrium and the superficial portion of the myometrium so that the uterine cavity is obliterated. A less radical application of the steam heat than this (for example, a temperature of  $110^{\circ}$  C. and an application of fifteen seconds) destroys only the superficial portion of the endometrium and leaves the uterine cavity in a fairly normal condition, so that in the average case this is the proper method of application. It would be only in the extraordinary case that atmocausis would be carried to its ultimate effect. Like all methods of this sort it was at first advocated by an enthusiast for everything. Atmocausis has been abused and has been productive of great harm. There have been fatal cases from sloughing of the myometrium; also in puerperal sepsis. There is only a small class of cases in which it is applicable, but in these cases I know of no method which can be said to take its place or do the work quite so well. These cases are only few in number and therefore this is not a method which could ever be employed very extensively, and certainly is not a method to be used routinely and indiscriminately.

DR. GEORGE E. PFAHLER read a paper on

THE TREATMENT OF UTERINE HEMORRHAGE BY MEANS OF THE  
RÖNTGEN RAYS.\*

DR. HORATIO WOOD read a paper on

THE DRUG TREATMENT OF UTERINE HEMORRHAGE.†

DR. WILBUR KRUSEN read a paper on

THE SURGICAL TREATMENT OF UTERINE HEMORRHAGE.‡

\* For original article, see page 860.

† For original article, see page 875.

‡ For original article, see page 885.

## DISCUSSION.

DR. WILLIAM EASTERLY ASHTON.—The whole question of uterine hemorrhage resolves itself to a question of diagnosis as brought out strongly by Dr. Krusen. The cases are few and far between in which we are unable to arrive at a conclusion as to the cause. Therefore, our first duty in all these cases is to carefully investigate not only the pelvis itself, but the entire organism. If we are unable as gynecologists to do this, and I am perfectly free to admit that I have not the necessary experience, we should call in an internist—you see I am distributing this work a little differently from Dr. Pfahler—and find out whether there is some constitutional cause for the uterine bleeding. It is absolute foolishness for any one to attempt by local means to cure a uterine hemorrhage dependent upon, say a mitral insufficiency or stenosis, or a lesion within the abdominal cavity obstructing the venous circulation. These things should be carefully gone into. If in a given case no constitutional or pelvic cause is shown for the hemorrhage we are obliged to consider the pathological conditions in connection with the internal secretion of the ovaries or some of the other ductless glands. It is a well-known fact that thyroid disease is often associated with uterine hemorrhages. We all know that on account of the interference with metabolism in myxedema that the want of proper coagulation of blood may be the cause of the uterine hemorrhage. However that may be, there is a relationship between these thyroid diseases and uterine hemorrhages. I remember one case in which a lesion of the uterine adnexæ occurred with enlargement of the thyroid, and as the lesion increased the enlargement of the thyroid gland also increased. Both tubes and ovaries were removed and found to be tubercular. In a few weeks the thyroid enlargement entirely disappeared. It is therefore very important in considering these cases to consider the ovaries. It is utterly impossible for us in a given case to say whether or not there is a deficiency or excess of ovarian secretion. I am opposed to the use of the x-ray unless operation is refused or the physical condition counterindicates it, for no one can tell whether or not secondary degenerations have taken place. Those of us who have experience in hysterectomies for fibroid tumors often see cases in which nothing is suspected in the tumor, and when it is cut open points of degeneration will be found. Therefore I believe it is not advisable to use the x-ray simply to cure the hemorrhage. I think the use of the x-ray in a young woman should be carefully thought over. Dr. Pfahler has called attention to the great sensitiveness of the ovary and testicle to the x-ray and the danger of sterility. Therefore following this application, except as a case of last resort, we should never use the x-ray in young women. With reference to atmocausis I have had no experience. If I had a patient requiring such treatment I would send her to my friend Dr. Hirst, who has had a large experience, because I feel that it is a very dangerous agent to use. There have been a number of deaths from the use of live steam within the uter-

ine cavity, and unless a man has very extensive technical knowledge he may do great damage. I believe the method should be used only as a last resort in patients who will not submit to a radical form of operation.

DR. C. C. NORRIS.—Uterine hemorrhage is a symptom produced by a great variety of lesions. In considering the treatment, therefore, it is of the utmost importance that the cause of the hemorrhage be determined, for then only can satisfactory treatment be instituted. For purposes of discussion these hemorrhages may be divided into two classes: those in which the etiology is clear and those in which the diagnosis is obscure. In the former class the lines of treatment are well defined and easily recognized. The number of cases falling into the latter class naturally is in inverse ratio to the skill of the attending physician. Occasionally, however, cases are encountered in which the pelvic examination reveals no marked pathologic condition, and in which it is possible to exclude syphilis, tuberculosis, chronic heart, lung, liver, and kidney disease, hemophilia, and the other germinal conditions that may give rise to hemorrhage. Under such circumstances a curetage should be performed for diagnostic purposes, and especially is this necessary when the patient is at or near the "cancer age." This point is so well recognized as to make its emphasis unnecessary. The relative frequency with which inoperable carcinoma occurs is, however, well known. Carcinoma is probably the most frequent cause of atypical hemorrhage occurring in women past forty years of age, and it is imperative that this condition be diagnosed or excluded early in all cases. In carcinoma of the cervix a positive diagnosis can generally be made without the aid of the microscope, although if doubt exists, a wedge-shaped piece of the suspected tissue should be excised for histologic examination. In carcinoma of the fundus, especially in the early stages, a positive diagnosis without the aid of the microscope is much more difficult to formulate.

In diagnostic curetage we have a method that is practically certain insofar as giving accurate information regarding the stage of cancer is concerned. In a large series of specimens that have come to the Gynecological Laboratory of the University of Pennsylvania not one case of carcinoma, so far as we know, has been overlooked. Cullen has had, I believe, similar results in the Johns Hopkins Hospital Laboratory.

For the purpose of demonstrating the practical value of diagnostic curetage in cases of uterine hemorrhage of obscure origin I have reviewed my own cases and the cases that occurred in the University Hospital for the last five years, and in which diagnostic curetage has been performed. In most of these cases the curetage was not so much diagnostic as confirmatory in character, in that the condition was, as a rule, suspected before operation. In all these cases the pelvic examination was practically negative, and the patient had been carefully examined by one or more members of the gynecologic staff, and in many cases by an internist, for the purpose of excluding a general condition that might be present to account for the hemor-

rhage. The patients were all from thirty-two to forty-eight years of age. Thirteen such specimens were examined. Among these were six cases of adenocarcinoma of the fundus of the uterus, one case of endometritis, one moderately large mucous polyp, and one placental polyp. As a result of the curetage the diagnosis in nine of the thirteen doubtful cases, all of which had been carefully studied clinically, was cleared up. In four of the thirteen cases the endometrium showed no changes of a sufficiently pronounced character to account for the bleeding. Whether these cases were of the type described by Theilhaber or were ovarian in origin cannot be stated positively. While defects in the myometrium may occasionally be the etiologic factor in such cases (macroscopically normal uteri) the theory of ovarian origin is, in the majority of instances the one that appeals to me most strongly. The four cases in which the curetage failed to clear up the diagnosis all gave very similar histories, and I recount one case to show the treatment adopted for them at the University Hospital.

Mrs. X., age, thirty-six; three children, one miscarriage; previous history negative. Two months before admission the patient had a severe hemorrhage, which occurred at a menstrual period and continued for ten days; this caused great weakness and was finally controlled by a uterine pack. The patient then became stronger and had no more bleeding until one week before admission, when free hemorrhage again set in. An examination on admission to the ward showed practically no pathologic condition beyond slight enlargement and softening of the uterus. Pallor, rapid, weak pulse, and other evidences of marked hemorrhage were present. The patient was not pregnant. A careful examination was made, and no general condition that might produce hemorrhage was discovered. This examination was later confirmed by the internists. Owing to the free bleeding and the general debilitated condition of the patient the uterus was packed, ergot and pituitrin were administered, and a curetage performed as soon as possible. The scraping proved negative on histological examination. The curetage and probably the rest in bed, together with the other treatment, tended to check the bleeding. The patient was very weak, and was kept in the ward for three weeks, during which time she rapidly regained her strength and showed no recurrence of the hemorrhage. Two weeks after her return, however, a moderately profuse hemorrhage, lasting for one week, occurred. Under medicinal treatment and rest in bed this ceased, but one month later another and extremely profuse hemorrhage occurred. She was brought to the hospital on the third day of the hemorrhage, and although she showed the effects of hemorrhage, her general condition was fairly good. Because of the profuse hemorrhage, and in view of her age and previous history, a supravaginal hysterectomy, with conservation of the tubes and ovaries, was performed. Convalescence was uninterrupted, and the patient has remained well.

In considering the treatment of these cases we must remember that they are not of infectious origin; that the curetage usually

checks the hemorrhage temporarily, and that if the patient can be gotten into good general condition, hysterectomy can be performed with very little risk, and offers a positive means of cure. By performing the conservative operation on the ovaries the unpleasant effects of the artificial menopause are avoided.

In young women the x-ray has not proved very satisfactory. In older women less reason exists for conservating the uterus. Nevertheless, under such circumstances, if the patient is well-to-do and in a position to lead a careful life, this treatment should be tried. In all cases diagnostic curetage should be performed for the purpose of excluding carcinoma. In these cases Kelly's operation of excision of a wedge-shaped piece of the myometrium and underlying endometrium has met with success in his hands. Both Kelly and Giles have reported pregnancies following this operation. In certain selected cases, especially those of hemophilic origin, such as are described by Dr. Hirst, atmocausis is doubtless of value. Under all circumstances, however, carcinoma must first be positively excluded. The fact that among our thirteen cases six proved to be early carcinomata is ample proof, if such were needed, of the importance of utilizing this diagnostic acid.

DR. EDWARD A. SCHUMANN.—I wish to call attention to the rôle played by syphilis in the causation of certain forms of uterine hemorrhage. It must be remembered that syphilis is par excellence a disease of the vascular system, alterations in the arteries being apparent even in the chancre stage. The vascular changes are usually of the type of endarteritis with partial obliteration.

Syphilis shares with tuberculosis the ability to select certain groups of blood-vessels for its activities and differs from the latter in that it usually selects smaller vessels and their branches. The uterine artery is, I think, a favorite point of attack.

In two cases of unexplained uterine hemorrhage seen during the past two years, wherein there was no demonstrable lesion of the uterus or the adnexæ nor any evidence of constitutional disease, the Wasserman reaction was distinctly positive and both patients were markedly benefited by the administration of salvarsan; one being entirely cured and the other greatly improved. Syphilis must therefore always be eliminated in the search for a cause of metrorrhagia of unknown origin.

DR. BROOKE M. ANSPACH.—Two or three years ago I was much interested in the subject of hemorrhage of undetermined origin and reviewed sixty-two cases reported in literature. From that study I came to the conclusion that these cases are not nearly so frequent as at first might be supposed. If you go over the reports critically you will find that the patients have heart or other visceral disease. In some cases the uterus was displaced posteriorly or subinvolted. In some cases there was ovarian cyst of the ordinary retention type or a small fibroid or a hypertrophied cervix or a cystic degeneration of the endometrium. In other words, in a large proportion of cases there was some lesion which might have accounted for the hemorrhage outside of the condition of the uterine wall. It does

not need to be proven that all of the causes mentioned may cause hemorrhage. When they are corrected, in the majority of cases, the symptom will disappear. There are nevertheless a few cases in which after the most careful and painstaking examination both local and general no cause can be found for the profuse menstrual or intramenstrual discharge. Then I believe the condition can be attributed to some physiological abnormality in the ovary. I believe this because the ovary is the essential organ for the production of the menstrual flow and if the ovary is removed the menstrual flow stops. It, therefore, must of necessity have a very pronounced influence on the degree of the flow and consequently lesions which possibly cannot be appreciated by macroscopic or even histological examination might be the cause of hemorrhage.

The cases in which no cause can be found are very few. I think that very often the systemic condition of the patient is overlooked. There are two main causes for the hemorrhage as Dr. Wood pointed out: Either an increase in the menstrual congestion of the endometrium or a diminished coagulability of the blood. I think that in a large proportion of the cases the use of the drugs he mentioned, ergot and its preparations, hydratis cotarnin, will do much in decreasing the hemorrhage and may ultimately cure some. I would emphasize the benefit of adding digitalis to the prescription. This acts happily in all cases and especially so if there is a sluggish pelvic circulation. I think the x-ray is an important addition to our armamentarium in the treatment of women past the age of forty. The members of the American Gynecological Club, who visited the German Clinics this summer, were impressed by the very excellent results reported in the treatment of fibroid tumor of the uterus. One of the foreign surgeons said he was operating on few fibroid cases as many of the intelligent women had heard of the results of x-ray treatment and preferred it to operation. Although I would not approve of the use of the x-ray except in those who refuse operation or are in poor shape for such an ordeal, it must have considerable influence in controlling the hemorrhage and is a therapeutic agent very much to be reckoned with.

So far as operation goes for the control of hemorrhage of undetermined origin, I believe that with suitable technic and experience, atmocausis is a very valuable method to be used after curetment and other nonoperative methods have failed. So far as vertical resection of the uterus is concerned, personally, I would not use it. In any case requiring operative treatment on the body of the uterus I should much prefer hysterotomy.

DR. JOHN B. DEEVER.—I am glad to have heard the papers and to add something upon this subject. If the theories advanced here to-night are put into effect I am sure that more cases of carcinoma of the uterus will be seen in the future. I believe there are but two causes, local and constitutional. If the gynecologist cannot recognize the constitutional causes, much as I dislike to make the statement, I am however forced to say he is out of his sphere in assuming the responsibilities of cases of this type. The local condition giving



rise to hemorrhage in the nonpregnant uterus occurs both within and outside of the uterus. It is not always possible to make a diagnosis even with the microscope. The curet is valuable in a small percentage of cases, but only in a small percentage. Where the cause is within the uterus and has not been discovered by examination with or without the curet, the first step I do in operating is hysterotomy, thus bringing into view the interior of the uterus when it can be definitely settled whether or not to extirpate.

The x-ray I do not believe has the field which we would be inclined to think from Dr. Pfahler's brilliant remarks. To my mind the x-ray is capable of doing more harm than good in the light of the small mortality from extirpation in experienced hands. Permit me to say I am not going to give my statistics as I do not believe others' statistics and I do not ask you to believe mine.

The question of low hemoglobin in the presence of bleeding from the uterus that cannot be controlled does not cut a very important figure as a contraindication to operation.

DR. J. M. BALDY.—I am sorry to find myself frankly in accord with Dr. Deaver, as much has been said. We so seldom agree on gynecological subjects that when I do agree with him I begin to doubt my own judgment. I agree with him that the man who cannot act the part of an internist, but has to have an internist make all his medical diagnosis, had better begin to learn the business over again. I don't believe that atmocausis has any place whatever in gynecologic practice. It is one of the things that ought to be discarded. Whatever Dr. Hirst may have gained must have been by the very utmost care and the greatest amount of judgment and skill. The x-ray I think has little effect and there are a number of risks that I think no surgeon will regard lightly. As for the anemia, only children would be afraid of operating in a low blood count. Men get over that. Dr. Deaver is a notable example. I remember when he talked of red blood corpuscles and certain percentages and looked at me with horror when I said I didn't give a hang what the counts were so long as the patient was in good general condition. Assuming that there are but two causes—local and general blood condition—what Dr. Wood has said has been exceedingly valuable and it had better take some of us back to our nursery days once more. We are at present flying too high on serum therapy for the good of common sense.

DR. G. BETTON MASSEY.—I wish to corroborate the findings of Dr. Pfahler, and this is in spite of having treated these cases successfully since 1888 without the x-ray. The reason I welcome the x-ray is that it will lessen the length of time necessary in the Apostoli treatment, which is a valuable method in many hands. It will lessen the time required from one to three years down to, as Dr. Pfahler has said, three to six months. I am more and more inclined to use the x-ray and to withhold the Apostoli intrauterine galvanic treatment in bleeding fibroids, except where indicated, because of the painful character of the electrical treatment. I gather from what Dr. Pfahler says of the negative effect of the

Röntgen ray alone after forty years of age that this conjoined treatment has a particular value, and that value is in the woman under forty. I felt quite concerned during the discussion as to what was going to happen to the woman under forty at their hands, and urge this combined method as the best solution.

In the case of a young woman of twenty-eight treated recently with the x-ray and the Apostoli treatment combined there has been a gain of 20 pounds in the year she has been under observation. She was under treatment a portion of the time only, with arrest of hemorrhage and reduction of the growth as well as this improved health. I do not know what portion of the effect to attribute to the x-ray and what portion to the electrical treatment, but that there is a value in the treatment of the x-ray I know from the demonstrated shortening of the time required. I also think that under forty the association of the x-ray and electrical treatment is particularly valuable if the x-ray is used as I use it, which is not the German way. I give lighter doses extended over a longer time and do not expect a cure in six treatments. Moreover, not one of these women have ceased to menstruate. There was a suspension of the catamenia in some cases for a time, but later the menstruation returned and was normal.

As to metrorrhagia uncorrected with fibroids I have not had a failure in years to get good results from the simple galvanic current, when the intrauterine pole positive and copper coated with mercury.

DR. F. HURST MAIER.—Whereas a careful investigation will usually determine a removable cause for most uterine hemorrhages, it is nevertheless true that there are cases, the so-called idiopathic menorrhagias or metrorrhagias, in which clinical and laboratory examinations fail to detect a cause. It is not unusual for these cases to die, directly from the loss of blood or indirectly from terminal conditions. This class of cases are helped by the administration of pituitrin. I believe that future experience will show pituitrin to be a valuable remedy in uterine hemorrhage. Its efficiency in puerperal hemorrhage has already been proven. Bab, in the *Wien. klin. Wochenschrift*. No. 27, 1911, reported thirty cases of menorrhagia and metrorrhagia, of a nonpuerperal character, in which he successfully employed pituitrin.

Besides its action upon the muscular elements, with contraction of the arterioles similar to that of adrenalin, only its effects are more prolonged, pituitrin also has a trophoneurotic influence upon the whole genital system, and thus acts in a dual capacity. Hoptater, in *Zentralblatt für Gyn.*, No. 46, calls attention to the value of pituitrin and hypophysis extract in the treatment of amenorrhea, hypoplastic uteri, and undeveloped ovaries; also in atrophic uteri when due to lactation, anemia, cachexia, etc. In most of the cases the desired results were obtained after a few injections of pituitrin.

## TRANSACTIONS OF THE SOCIETY OF THE ALUMNI OF THE SLOANE HOSPITAL FOR WOMEN

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*Meeting of January 24, 1913.*

*The President, FREDERIC O. VIRGIN, M. D., in the Chair.*

DR. WM. H. WELLINGTON KNIPE reported

### A CASE OF PUBIOTOMY FOR FUNNEL PELVIS,

and said:

"This case is reported because, first, the operation of pubiotomy enabled us to deliver a living child at a period in labor when no other operation could have judiciously been undertaken; second, the operation has permanently enlarged the pelvis so that future labors in our patient will probably require no operative interference; third, the functional result as to locomotion is all that one can desire; fourth, the puerperium was in no way different from one following a normal aseptic labor, the patient in no way suspecting that anything unusual had happened to her until so informed by me one week after the operation.

This case illustrates also a fact that is frequently overlooked: namely, that a normal labor with the first pregnancy is no indication that subsequent labors will be likewise, for our patient had been delivered of a 6-pound child with the aid of forceps two and a half years previously, while the second labor with a child 8 1/2 pounds in weight required a pubiotomy to bring it to a successful issue.

Our patient (confinement No. 5635, N. Y. Post-Graduate Hospital), twenty-seven years of age, born in the United States, a housewife and ii-para, gave no history indicating any pelvic disturbance either bony or organic; her weight was 120 pounds, height 5 feet 4 inches, somewhat undernourished; the menstrual history had been normal, the last period Nov. 15, 1911; had no miscarriages. Her first labor two and a half years previously had required forceps with anesthesia for a 6-pound child, but I have been unable to ascertain how difficult the forceps operation was.

The patient's pelvic inlet measurements were practically normal externally: between spines 24 cm., between crests 26 cm., external obliques right 22 cm., left 22 cm., external conjugate 20 cm. Internal examination gave a diagonal conjugate of 12 cm. (practically normal), the ischial spines were somewhat prominent and the pubic arch rather narrow; for some unexplained reason the measurements

of the pelvic outlet were not taken, which fact is to be much regretted as we are unable to compare the old with the new measurements.

As our patient had been having false labor pains for two weeks and as the fetus seemed to be at full term, judging both from the menstrual history and by abdominal examination, we induced labor by means of the modified Champetier de Ribes bag on August 19, 1912, in the afternoon; early the next morning the cervix was fully dilated, the head resting in the brim of the pelvis in the L. O. P. position.

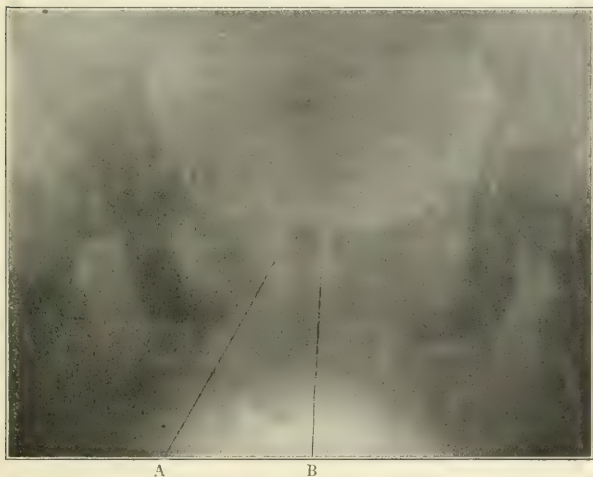


FIG. 1.—A. Fibrous union of pubiotomy wound. B. Cartilage of symphysis.

After waiting three hours to give the head a chance to mold I applied the Tucker-McLane forceps to the head engaged in the brim of the pelvis. With reasonable traction the head was brought into the hollow of the sacrum and there rotated by means of the forceps to an L. O. A. position; when the blades were replaced traction was again used but we could not by the use of any justifiable force bring the head through the pelvic outlet, as the spines of the ischium impinging upon the parietal bones of the child prevented any further descent of the head.

As the fetal heart now gave evidence by its slow rate and irregularity that there was considerable cerebral compression, pubiotomy was performed in a few moments, after which the head was easily extracted by one pull with the forceps. The child weighing 8 1/2 pounds was somewhat asphyxiated but after a few moment's treatment began to breathe and is a healthy child to-day.

The following were the fetal measurements: suboccipitobregmatic 10 cm., suboccipitofrontal 10.5 cm., occipitofrontal 12.5 cm., occipitomenta 14 cm., biparietal 10 cm., bisacromial 13.5 cm. Sex, male; weight, 8.5 pounds; length, 49.5 cm.

The pubiotomy was performed by making a transverse incision 2 cm. in length over the left pubic bone and then passing the Döderlein pubiotomy needle downward and inward close behind the bone and making its exit on the inner side of the left labium minus; the Gigli saw was then drawn through the wound and the bone severed by a few sawing motions. Pressure was exerted by an assistant upon the sides of the pelvis to prevent a sudden spreading of the sawed bone. The bleeding from the wound was very slight and easily controlled by gauze pressure. The wound over the pubic bone was closed by skin sutures and a rubber tissue was inserted into the wound of the labium minus; three bands of adhesive plaster 3 inches in width were encircled about the patient's hips, after pressure had been exerted upon the sides of the pelvis to approximate the ends of the sawed bones.

The puerperium in this case was uneventful; the temperature never rose above normal, there was no bladder disturbance, the patient moved about in an ordinary bed and was without pain. On the third day after operation I found the patient lying on her side totally unaware of having undergone any operative interference.

Our patient left the hospital at the end of three weeks walking easily and without pain or limp.

I have taken an x-ray picture of this patient's pelvis as it is to-day nearly five months after the pubiotomy which shows no bony but a fibrous union, although the patient walks easily without any limp and upon bimanual examination there is a firm union of the bone; the picture shows a permanent enlargement of the pelvis due to the separation of the cut bone for a distance of about  $1\frac{1}{2}$  cm.

The measurements of the pelvic outlet at the present time (after operation) are as follows: transverse 8.5 cm., anteroposterior 11.5 cm., posterior sagittal 7.5 cm. These measurements take the pelvis out of the class of funnel pelvises requiring assistance at labor, so that future labors in our patient should prove normal ones as far as the pelvic outlet is concerned. I might add that our patient is again pregnant.

I believe that no operation is so useful as pubiotomy in the treatment of these cases of funnel pelvis; in working with this type of pelvis one must be conservative, for many labors will be spontaneous or require a simple forceps operation. The great benefit of pubiotomy is that it may be used after we have given ample time for spontaneous labor or after we have applied forceps for a considerable time and realize at last that we need more room; at a time when Cesarean section would not be justifiable, there would be left only the choice of craniotomy or pubiotomy.

Too little attention is given to these cases of typical funnel pelvis; for because the measurements of the pelvic inlet are normal and we are unable to feel the promontory of the sacrum by vaginal

examination, we assume that the outlet is normal. The statistics published by Whitridge Williams and others prove that the funnel pelvis is the most common pelvic deformity in white women, and of these cases one in five will require some operative interference ranging from forceps to craniotomy, pubiotomy or Cesarean section.

However, one must not be in haste to operate, for with a small head or with excessive molding the child may be born spontaneously even with small outlet measurements; one of our cases with a transverse measurement at the outlet of 6.5 cm. and a posterior sagittal of 6.5 cm. had an easy labor.

In the treatment of these cases one must not forget that the exaggerated Sim's position for the patient will increase the posterior sagittal diameter to an appreciable degree and thus aid spontaneous labor.

#### DISCUSSION.

DR. GEORGE L. BRODHEAD said: "Dr. Knipe is certainly to be congratulated upon the result in his case of pubiotomy. The time had evidently gone by in which Cesarean section could have been safely performed, and most of us, I think, would under similar conditions prefer pubiotomy to Cesarean section. The great difficulty with pelves of the funnel type is to know whether labor is going to be terminated spontaneously or not. Dr. Knipe will remember a case to which he referred, where, with a pelvis probably as small as the one he had, we waited I think forty-eight hours, or even longer, before the patient finally expelled the child by her own efforts. In that case strychnin and pituitrin were used to advantage, especially the latter, and the result was all that could have been desired, although at the beginning of this labor we thought the case would terminate in all probability by pubiotomy. I think he is especially fortunate in getting a result of this kind in a primipara, because at some of the clinics, notably the Dresden clinic, pubiotomy has been given up absolutely in primiparæ; it is done only in multiparæ.

In regard to subsequent labors, I think that about a year ago Van de Velde published a list of 124 cases in which 75 of the 124 were delivered later either normally or by forceps or version, indicating that the pelvis is probably either permanently enlarged or is enlarged during the process of labor.

"Now, the question comes up in such a case as Dr. Knipe has reported as to what course of treatment is to be followed in subsequent pregnancies. My own preference, in a case of this kind, as in all cases of funnel pelvis, where we see the patient early enough, would be to restrict the diet and induce labor sometime during the last month, probably during the early part, but the conditions in this case certainly indicated pubiotomy, and I think he is to be congratulated on the excellent result."

DR. O. PAUL HUMPHSTONE said: "I have had some experience with these funnel pelves and I have come to the conclusion that the



use of pubiotomy in a primipara is not justifiable, from two experiences which we have had over in Brooklyn.

"So far as the management of them is concerned, I have come pretty firmly to the conviction that a woman who has any kind of a pelvis should go to term.

"We have done three successful Cesareans upon funnel pelves which have been treated with the forceps where the head has been clear at the outlet and the women have been long in labor, and I think, as a general principle, that it's always better to do a Cesarean than a pubiotomy. My own opinion in the matter is that we are more conservative than practically necessary and that in late Cesarean, if the operation be done quickly, these patients are better off than if they are treated by pubiotomy."

DR. J. MORRIS SLEMONS, of Baltimore, said: There are two or three things in Dr. Knipe's paper that deserve emphasis.

In the first place, from the measurements he has given, though they were taken after operation, I should have no hesitancy in saying he had to deal with a funnel pelvis. The measurement between the tubera after operation was found to be 8.5 cm. and, since we know that there is always an enlargement of 1 cm. and sometimes 2 cm. following pubiotomy, we are justified in concluding that the measurement originally was below 8 cm.

But to determine what effect a contracted outlet will have upon the course of labor we must also measure the anteroposterior diameter. The importance of this factor was demonstrated by a case observed in the early days of the study of funnel pelves at the Johns Hopkins Hospital. In this instance the measurement between the tubera was 5 cm. At that time only the transverse measurement of the outlet was being taken; and, therefore, it seemed almost certain that a Cesarean section would be required in this case. The patient stated, however, that she had had a previous natural labor and expected to have one this time. Her view was justified for finally when she went into labor she was delivered not only spontaneously but actually before the interne could get from his room to the ward, which perhaps took fifteen minutes. This experience convinced Dr. Williams that some factor other than the transverse diameter of the outlet must be taken into account; and this factor, we now know, of course, is the measurement from a line joining the tubera to the tip of the sacrum, which is called the posterior sagittal diameter. When the distance back of the tubera will accommodate the head, spontaneous delivery will occur, even though the distance between the tubera is less than the biparietal diameter of the fetal head.

Finally the x-ray in this case deserves emphasis. In this plate you see clearly the opening between the cut ends of the bones; the union here, in other words, is a fibrous one. And that is the rule after a pubiotomy. In a series of about fifty cases of pubiotomy performed in the clinic of Dr. Williams at the Johns Hopkins Hospital there has never been a case of bony union. Dr. Kosmak tells me that he has seen one such case but such an experience is

very exceptional. It is the fibrous union after this operation, of course, that makes it a curative measure in cases of funnel pelvis.

I agree with Dr. Knipe that in subsequent labors this woman will be delivered spontaneously.

DR. W. H. W. KNIPE, in closing the discussion, said: "I shall not enter into a discussion of the relative merits of Cesarean and pubiotomy. I believe Cesarean section is a very simple operation; I know of no simpler abdominal one in gynecological practice. At the same time I must confess that when I got through with this operation of pubiotomy I felt that I had never done anything that was easier and I am quite positive we did not subject the patient to the possible mortality through pubiotomy that we would have done had we performed a Cesarean section.

"The important point is this: the patient is now pregnant again; so that had we done a Cesarean section, that patient, I think with justice, would ask us to empty that uterus. She has asked it already as it is. Of course, I told her we could not do it, but had we done a Cesarean section it would be necessary now to perform an abortion or later to do another Cesarean operation.

"In this particular case I still feel that pubiotomy was the better operation."

#### SPONTANEOUS RUPTURE OF THE UTERUS.

DR. E. M. COLIE, JR., reported this case.

"We have all in mind the recent report, within the last two or three years, by Dr. Brodhead of some cases of spontaneous rupture of the uterus and, on the same evening, I think, a case was reported by Dr. Brown. This case occurred in the same service from which Dr. Brown reported his case. The facts are briefly these:

"The patient was an Irishwoman, thirty-four years of age; she was vii-gravida, vi-para; she had no pelvic deformity and no striking physical abnormality save that she was poorly nourished. Her six previous labors had occurred within the last ten years. She had been married eleven years. Her labors had been smooth. Most of them had been accomplished with the assistance of a midwife and there had been no complications. All of the babies had lived, labors had all been easy, none of them had been particularly rapid.

"History of the present pregnancy: The patient had come under observation a month before her time of confinement. She was looked over carefully and her urine was examined and found to be normal. She fell into labor. The first stage lasted somewhere between ten and twelve hours. There was nothing striking about it up to the time of full dilatation, which occurred at about 10 o'clock in the morning. There was no further advance. The membranes were unruptured and the student on the case simply sat and watched it; pains were moderately frequent, increasing somewhat in frequency and of fair force. At 12 o'clock, the patient's condition being about the same, the student went out to lunch, thinking that with the unruptured membranes and the regular pains, he was safe in so doing.

He stayed out to lunch a full hour, which, of course, he had no right to do, and came back to meet the husband who told him that the patient was in bad condition. The student looked at the patient and made a diagnosis of internal hemorrhage. The patient told the student that she had had no pain other than the pains of labor. The student telephoned to the hospital at once and the staff man reported the case to me as I was making rounds. Stopping long enough to get a bag with full equipment the staff man and I got down to the tenement where the patient was. Upon our arrival it was at once apparent that the uterus was ruptured. The patient was still living. Knowing that laparotomy offered nothing in this case, I tried and did a rapid version and extraction. The student tells me that the entire operation took forty-five seconds, which shows that there was no obstruction on account of the size of the child. It was a vertex presentation. I cannot now tell you how I got hold of a foot, for when I examined the patient's abdomen before the operation I was certain that the upper (breech) pole of the fetus was free in the abdominal cavity. There was no vaginal bleeding following the delivery and I went up with the hand, after turning the baby over to an assistant, and found that the rent was a large one in the left uterine horn. Through this rent it was possible, or would have been, to palpate anything in the abdomen. The patient was removed from the table and died within five minutes. I could get no autopsy. I know of no reason why the uterus should have ruptured; there was no obstruction; the head was not large; it was fairly flexed but not well engaged, and I could work rapidly and easily."

#### DISCUSSION.

DR. GEORGE L. BRÖDHEAD said: "I think I have reported two cases of spontaneous rupture of the uterus before this Society. Both of them were in multiparæ with normal pelves; both with short labors and both with a previous history of very easy labors, and in one of these cases only was there any predisposing factor and that is simply a problematical one in that the patient had a curetage done several months before she became pregnant the last time and whether the uterus had been thinned out in one particular portion by this curetage we, of course, have no way of telling. One of the patients died before the Post-Graduate interne could reach her. The other case was diagnosed immediately by the staff man, who was present and brought into the hospital, where the child was extracted, and the uterus sewed up, and the woman made a good recovery.

#### REPORT ON A CASE OF CHORIOEPITHELIOMA.

DR. W. MORGAN HARTSHORN described the case of Mrs. C., twenty-nine years of age, confined for the first time in May, 1910. The family and personal history was negative and the pregnancy

uneventful. The labor was complicated by a breech presentation which was terminated by an extraction after twenty hours. The child was a well-developed and vigorous boy. The second pregnancy began in March, 1911, and the patient was well until the first week in October when she had an attack of severe abdominal pain which extended around to the left hip. There was also a slight bloody vaginal discharge which, with the pain, was attributed by the patient to a strain. When examined in November the woman appeared perfectly well, the fetal heart was strong, 160, and loudest in the left lower quadrant of the abdomen, the presentation, a vertex. When seen by Dr. Hartshorn on December 10, the condition was apparently the same. Labor began on the evening of December 20, and after rupture of the membranes with two fingers dilatation, the mouth and chin could be felt anteriorly and to the left. The fetal heart was not heard and the head well engaged. Labor progressed slowly and the face was born with the chin anterior. The fetus was macerated and the placenta showed large areas of fatty degeneration. The patient went through a normal puerperium and was discharged in the third week in apparently excellent condition. On January 16, three days after the doctor's last visit, the husband telephoned that his wife had had such a severe hemorrhage that she had fainted. Although improved by the next day she had another hemorrhage on the night following. The uterus, which upon final examination appeared well involuted, could now be felt above the symphysis, boggy and filled with clots. A curetage was done and the material removed strongly resembled retained placenta. The patient flowed considerably after the curetage and an obstinate cough developed. Examination of the uterus showed it again to be soft and boggy and there was also a suspicious soft nodule in the wall of the vagina on the right side. A second curetage was done and the specimen examined was found to be a chorioepithelioma. The patient was transferred to the Sloane Hospital and operated upon by Dr. Cragin, who did a panhysterectomy on February 10, 1912. The left ureter was transplanted and resected for metastases which involved the same. After operation the patient failed quite rapidly and developed evidences of pulmonary involvement marked by dyspnea and scattered râles, followed finally by edema of the lungs. She died on February 27, and a complete autopsy was done with the following results:

*Anatomical Diagnosis.*—Chorioepithelioma, metastases of the lungs. Pelvic abscess.

Body of a well-nourished and developed young woman, with a moderate amount of adipose tissue. Skin pale and firm. Pupils in middilation. The left leg is slightly larger than the right and is edematous. No external markings upon the body. In the midline below the umbilicus is a gaping incision 15 by 5 cm. The muscles have united leaving the skin ununited. The wound is fairly healthy. Peritoneum is normal. There are a few fairly firm adhesions around the wound. The uterus and adnexa have been removed. Pleuræ free except for a few delicate fibrous adhesions posteriorly

and on the sides in both cavities. Small amount of fluid in each cavity. Lungs studded with nodules varying in size from 0.5 to 3 cm. in diameter. These are of a red color and moderately soft and friable. They show hemorrhages into their substance. On cutting the lung tissue, the tumors are seen everywhere. The uninvolved lung tissue is soft and crepitates. The bronchial nodes are enlarged and deeply pigmented. Posterior to the root of the left lung is a dark red mass easily torn and firmly adherent to the parietal pleura. Heart of normal size. Valves are normal; no vegetations on the valve leaflets. There is considerable postmortem clot. Spleen of normal size and consistency. Kidney of normal size, pale in color and consistency, markings fairly well preserved, cortex of normal thickness, capsule strips easily. An opening 3 cm. in diameter is seen in the bladder at the point of entrance of the left ureter. This opening leads into a large pelvic abscess occupying the site of the removed uterus. The end of the uterus is attached to the bladder by a suture. Pus and necrotic tissue are found around the rectum, and there is an opening into the vagina admitting two fingers. The vagina shows necrotic tissue within 2 inches of the external opening. No tumor growth is found in this region. Pancreas, hard and fibrous. Section shows a dense surface. Weight 100 gm. Liver, right lobe somewhat enlarged, surface coloring normal, no abnormal conditions found upon section. Gall bladder, normal. Stomach, intestines and suprarenals normal.

#### DISCUSSION.

DR. FRANK S. MATTHEWS in opening the discussion said: There is no more interesting tumor in the body than chorioepithelioma. It has a number of unusual features, for instance, though epithelial in origin it forms its metastasis like sarcoma through the blood-vessels instead of lymphatics. It is interesting because it is a tumor of one individual—the fetus—growing in the tissues of another individual—the mother.

This tumor has a bearing on the question of what feature or new character of body cells is assumed in order that a malignant tumor should be formed. In looking at sections of tumors we chiefly look for evidence of invasion of normal tissues by tumor cells as the feature which most definitely indicates malignancy. But the syncytial cell by nature possesses this character which we think most definitely indicates malignancy. Without the ability to penetrate mucosa and blood-vessels the ovum would not be able to establish its vascular relation with the uterine mucosa. The only difference then that we can see between the behavior of syncytium and a malignant tumor is that in the syncytium the invasion is strictly limited by the body needs while in the malignant tumor there is no relation between body needs and amount of invasion.

I saw Dr. Hartshorn's case with him in consultation but can add little to what he has said about it. The diagnosis was clear both

from the sections of removed tissue and from the clinical side. The uterus was enlarged, there were metastasis in the broad ligament and a cough had begun. I was especially interested because I had shortly before seen another case. My other case I saw one week after a curetage, when she was profoundly anemic and had had a mole formation as the termination of a recent pregnancy. The first thing I noted was something not present in Dr. Hartshorn's case. The finger in the vagina felt shot-like bodies on the vaginal wall, they looked dark blue, were about the size of peas and were raised above the surface. On touching one it broke down and bled profusely. New ones appeared daily. I excised one or two for examination. They consisted of blood clots in which by searching one could discover a few syncytial strands. The uterus was cleaned out and packed but it was difficult to get the packing out because of the furious hemorrhage. This patient developed signs in the chest and I think had a pleural hemorrhage. She died in ten days and an autopsy was not permitted. The most frequent metastasis are those of lungs and vagina and this patient had both. My clinical experience with the disease is limited to these two cases though I have seen sections of quite a number of others.

DR. GEORGE D. HAMLEN said: "I have never seen a case of this character. From the gynecological standpoint it is very truly interesting—these cases of cystic degeneration which we run across.

"Now, as to the subsequent treatment which we give patients in whom we find that this condition has developed: I was interested in the reports of Bellevue since 1904 and I think I found about eight cases of cystic degeneration of the chorion. In only two of these was hysterectomy performed. In the first instance, at the time when the curetings were discovered on account of the spongy condition of the uterus but subsequent examination of the inside of the uterus failed to reveal that there had been any entrance of the chorionic tissue within the substance of the uterus. That patient would undoubtedly have recovered, as all the other cases of cystic degeneration of the chorion do, and as far as the history shows, there was no subsequent return. The other case was one in which there had been cystic degeneration of the chorion and cureting with report that the chorionic tissue had penetrated into the musculature of the uterus. As soon as this report was made a hysterectomy was performed and the subsequent examination of the uterus showed, according to the pathologist's report, a chorioepithelioma. Examination of the same specimen by another pathologist gave a report of decidual endometritis with some degeneration. In this instance it would seem that hysterectomy was justifiable and the patient made a good recovery.

"The interesting part to me in these cases is as to how we are going to know in which cases removal of the uterus is demanded because of the fact that the reports as we get them from the pathologists seem to vary. That to me is the point of interest, the point I would like to hear discussed.

DR. H. W. H. KNIPE said: "I do not know of any problem the obstetrician meets with which compares with this in difficulty, but I



would say that in a case like this with metastasis, it is really of no moment whether we make a diagnosis or not as the patient is doomed; but in those cases, in which the chorioepithelioma is preceded by an hydatidiform mole, it is important to know whether the mole is malignant. I have had three or four cases of hydatid mole in the last two or three years and in each case I had anywhere from one to three or four pathologists give their different diagnoses on the question of malignancy and I think we can as a rule state that we should have two or three opinions at a time when a diagnosis is of some moment; so I feel now that I do not care what the diagnosis from the pathologist is in regard to these early cases. I trust more to the finger inside the uterus. I think if we get these moles that penetrate the substance of the uterus, the musculature of the uterus deeply, I think we are more or less justified, at least as much as we are in any way, in extirpating those uteri. I think two or three men in New York make a diagnosis of chorioepithelioma by slitting up the anterior surface of the uterus, to get a full view of the interior of the uterus, at a time when the only symptom is some unusual hemorrhage and I think that the only possible way of saving cases of this kind is perhaps in being a little too radical; and where we have hemorrhage that is unexplained, following delivery, usually I think we ought to have courage enough to perhaps make a few mistakes and perhaps cut two or three uteri unnecessarily to find out one case, an early case, when it is possible to eradicate the disease. Several men in New York have reported cases that after a period ranging from two to five years have remained free from disease, following an early hysterectomy."

DR. WALTER M. BRICKNER presented

#### A CRITICISM OF HYPOGASTRIC LAPAROTOMY THROUGH THE LINEA ALBA.

He said: "I am neither an obstetrician nor, in the special sense, a gynecologist, therefore, I am approaching these topics from across the borderline of general surgery.

"As a house surgeon fifteen years ago I was quite accustomed to seeing both gynecologists and general surgeons perform laparotomy directly through the median line; but later in my own work I soon changed from this method. I think a good many other surgeons have also, and have been accustoming themselves to making their incision through the rectus muscle on either side; but I find that the median incision of the abdominal wall through the linea alba, is still very popular with gynecologists. I am sure that the number of postoperative ventral herniæ coming under my observation following a gynecological operation through a median hypogastric incision can be counted in scores; and these were not cases in which there had been infection or drained wounds, but cases that had been sewed up and gone on to primary union. I have operated upon so many of these median ventral herniæ that I have adopted a system of technics for the operation, with which I will not detain you tonight, but which I may publish later. I think perhaps that not all gynecologists and those general surgeons who still use this median incision appreciate how many ventral herniæ develop after

the incision, perhaps because these cases do not often return to them, but fall into the hands of general surgeons. When I was talking of this matter to one or two gynecologists they assured me they had never seen a hernia after their operation through the linea alba, and I replied that I had operated on several of their own cases. I made a little sketch to refresh your memory of the anatomy and I think you will at once see the disadvantage of the incision directly through the linea alba. You will all remember the arrangement. In the median line all of these tissues are fused into one; also, of course, it makes it exceedingly simple to incise them, but that is the very reason they develop a hernia afterward, especially in multiparæ whose fasciæ here are stretched. Even in younger subjects, where the tissues are fairly firm, I have seen a hernia develop after incision through the linea alba in which there had been primary union, and I have in mind a case of hysterectomy through a median incision, in which the entire wound broke open from repeated vomiting—an accident I have never seen after a celiotomy through the rectus. I want to plead that the incision through the abdominal wall should be made to one side or the other through the rectus muscle. Here we encounter not one layer simply, but the anterior rectus sheath (sometimes double), the rectus muscle and the posterior sheath (above the semilunar line of Douglas), and then the transversalis fascia and the peritoneum. Make an incision if you want through the median line in the skin, but the abdominal wall itself should be divided to one side or the other of the midline, if only half an inch from it. Of course, there is this very slight disadvantage, that one often encounters the epigastric vessels or their branches, and has to provide against injuring them, or may even have to tie them. There is another slight objection, which is really an advantage, viz., instead of making one incision one has to take the additional time to cut through two layers of fascia and split or retract the muscle, but that is an argument for the strength of the union when these tissues are sewn up layer by layer after the operation is completed. I do not insist on a lateral incision when entering the belly above the umbilicus, because a hernia is less liable to develop up there, but personally I always employ it even here, entering through one rectus, usually the right. In a case of carcinoma, as of the stomach, I would never think of making an incision through the median line, and I always use linen sutures for sewing up the fascia, because in these cases there is a tendency for the wound to break open after the stitches are removed and the wound has apparently healed, especially if the patient is cachectic."

#### RUPTURE OF PYOSALPINX NOT A RARE ACCIDENT.

DR. WALTER M. BRICKNER reported this case.

"Last May in *Surgery, Gynecology and Obstetrics*, I reported a case and collected the literature, going back a good many years, of cases of rupture of pyosalpinx causing general peritonitis and I

found in all ninety-one cases, which seemed, of course, a rather small number, and, indeed, the general impression is that the condition is a rare one.

"I shall read the history of the case I then reported:

"Mrs. T., aged nineteen, married one year. Her husband had had urethritis several times, the last infection only a few weeks before marriage. During the third month of pregnancy, Mrs. T. developed a profuse vaginal discharge and dysuria, for which she was treated with symptomatic cure, during last winter (1911). She felt well otherwise during her pregnancy, and in July she had a normal and easy confinement. In spite of prophylactic silver installations, the infant had purulent ophthalmia for ten days. There was noted, however, no abnormal vaginal discharge immediately before or after confinement.

"Four weeks after delivery the patient was confined to bed for a week with pain in the right iliac region and fever (temperature about  $101^{\circ}$ , pulse 90). After a week's interval she was again in bed for a week with fever ( $101^{\circ}$ ), pain on the right side and diarrhea. In neither of these attacks was there vomiting. In both there was tenderness in the lower right iliac region, and in the right fornix vaginae. Consultation refused.

"Thereafter the patient was up and about and free from local symptoms, but, her husband said, she did not look well and she did not gain in strength.

"August 28 to August 30: headache, chills, cough and diarrhea, but no pain; not confined to bed.

"September 2 (1911), Mrs. T. called at the doctor's office at 2 P. M. to weigh the baby; felt well. At 4 P. M., while at stool, she was suddenly seized with severe general abdominal pain, and fainted. Dr. Rudomin, immediately summoned, found the abdomen distended, tense and too tender to permit satisfactory palpation; temperature  $103^{\circ}$ , pulse 140; nausea, but no vomiting. The pain soon subsided and the abdomen became less tense. Dr. Rudomin made a tentative diagnosis of appendicitis.

"At 8 P. M., in consultation, I found a pale, thin woman with the facies of peritonitis, rather distended abdomen, percussion dull in the flanks, tympanitic anteriorly, both recti somewhat rigid, marked tenderness in the right iliac region, no pain, temperature  $104^{\circ}$ , pulse 140. Vaginal examination, much resisted, revealed slight fullness and marked tenderness on the right side. I made a diagnosis of purulent peritonitis from the rupture of some viscus, probably the appendix.

"All the above, as here set down, would bespeak the lesion actually found a few hours later; but many of the facts of the preceding history here related were not elicited at the time, nor were the physical findings clearly defined—indeed, two hours later, at Mount Sinai Hospital, an experienced surgeon, also called in consultation, inclined to a diagnosis of typhoid fever.

"Just before operation, blood examination showed 28,000 leukocytes, polynuclears 85 per cent. Examination under anesthesia

revealed a small mass in the right fornix, which, however, was still thought to be of appendiceal origin.

"Upon opening the abdominal cavity, through the right rectus (11 o'clock of the same evening, seven hours after the attack of severe pain and syncope) abundant yellow pus welled up. While the operation proceeded, this pus was aspirated by the Kenyon and Poole apparatus from the colonic gutter, the pelvis and the intestinal coils. I found the appendix in the pelvis, buried in a mass consisting partly of omentum, from which it was easily shelled. Externally it was greatly inflamed, but there was no perforation and the mucosa was neither ulcerated nor gangrenous. It was evident, therefore, that the source of the peritonitis must be elsewhere, and I next sought the right appendages. These—tube and ovary matted together—proved to be the mass by which, and the omentum, the appendix had been surrounded. In about the middle of the superior border of the thickened, enlarged but partly collapsed tube was a ragged hole in which the tip of the thumb could enter. Tube and ovary were quickly removed *en masse*. A dram or two of pus was in the tube. The patient's condition did not warrant investigation of the left appendages.

"Culture inoculations (subsequently reported 'no growth' by Dr. F. S. Mandelbaum, the hospital pathologist) were made from the peritoneal pus. No smears were made, however." The patient recovered after a very stormy time.

"Since then I have operated upon two further cases and I have knowledge of at least two more, and I have come to the conclusion that rupture of a pus tube is not a rare condition, however much it may be, if we want to use the word, uncommon. There is another interesting point in this connection and that is that a good many experienced men have not seen any of these cases. Several gynecologists have told me that they had never seen one. I think this is because so many of these cases are admitted to the surgical wards of the hospitals with the diagnosis of appendicitis, and in the literature you will find that in the preponderance of cases the lesion is on the right side.

"The differential diagnosis after rupture is not important, however, because in these cases the indication for operation, namely, the evidence of rupture of a viscus with general or localized purulent peritonitis, is a clear indication for operation. The interesting point lies in the diagnosis and treatment before rupture. We are accustomed to treating acute pyosalpinx conservatively, and very properly so. Yet several of the cases I collected of rupture were cases of *acute* pyosalpinx, although most of the cases to be sure were of subacute and chronic pyosalpinx. Are there then not some cases in which we are justified in abandoning the entirely conservative treatment in order to drain a pus-tube that is threatening rupture? That brings up the question, Can we tell when a pus-tube is threatening rupture? I think we sometimes can. In the case of which I read the history and in several others there was this significant train of symptoms—for about a week previous to the actual time of rupture the patient

had a series of attacks of severe pain associated with fever, and in some cases even associated with faintness, not quite as marked as the fainting accompanying the actual rupture itself, and these persistent attacks of severe pain, it seems to me, are fairly suggestive although not in themselves diagnostic, of an impending rupture. Whether these attacks of pain are due to increased tension in the pus-tube, or to ulceration of the wall of the tube, or, more probably to a sort of "progressive rupture" of the tube (more or less walled off, perhaps), I cannot say.

"Concerning the diagnosis, then: a fulness in the posterior fornix may, of course, be due to an appendiceal abscess, but this and repeated attacks of pain for a week or two, and a history of recent confinement, of uterine instrumentation, or of gonorrhea, are all truly suspicious of pyosalpinx rather than of an appendiceal abscess; and when there are these attacks of fever and of severe pain, usually localized, I think we are justified in abandoning conservative treatment and at least draining that pus-tube through a posterior vaginal incision to avoid the rupture that these symptoms portend."

#### DISCUSSION.

DR. RALPH W. LOBENSTINE in opening the discussion said: "I agree with the speaker, that an acute rupture of a pyosalpinx, is a comparatively rare complication. The condition is one that is associated with either a pelvic peritonitis alone, or with a rapidly spreading, diffuse peritonitis. Two cases of this character have come under my personal observation. The one, with an acute rupture of a double pyosalpinx (operated upon in 1901 by the late Dr. Francis Markoe) was early operated upon and was saved after a tedious convalescence; the other—an acute exacerbation of a subacute pyosalpinx, developing a few days after labor—developed a rapid peritonitis and died soon after operation.

DR. JOHN VAN DOREN YOUNG said: "Pyosalpinx has been a subject of great interest to me in my work for the past twenty years.

"Dr. Brickner spoke of gynecologists who had never seen a rupture of a pyosalpinx. I believe it is the training of the gynecologist that enables him to appreciate the importance of salpingitis, especially when it is a pyosalpinx, and that the fact that many of us have not seen a ruptured pyosalpinx in our own practice is a matter for congratulation. Dr. Markoe's case was evidently an uncared for pyosalpinx that had ruptured on the way to the hospital. The case of Dr. Brickner was apparently one of pyosalpinx due to an infection after labor, possibly of gonorrheal origin, if I understand him rightly. If both of these cases had had routine gynecological treatment, rest in bed, hot douches, ice-bag to the abdomen, and careful watching, it is my opinion that they would not have ruptured. If the expectant treatment fails to control the inflammatory process, the patient will give ample warning before danger of rupture is imminent. However, in my experience, the percentage of cases requiring an immediate operation is small, but no case, in which a

diagnosis of pyosalpinx has been made should be allowed to be up and around, thereby inviting the danger of rupture, until the cooling-off treatment has been carried to such a degree that the physician feels there is no immediate danger of rupture. If this result is not obtained, an immediate operation should be urged. Should the patient decline operation, she should be warned of her very real danger. Any patient on whom you have carried out the expectant treatment, as long as you deem right, should not be allowed to leave your care without impressing upon her and the family the seriousness of her condition. I think that all these cases should be treated as serious surgical conditions, and that Dr. Brickner has sounded a word of warning to general surgeons and gynecologists, a warning that should be heeded, namely, that patients suffering from this condition should be watched until all danger of rupture is passed, or they have been operated upon. One who fails to appreciate the importance of this condition, certainly does not do his full duty to his patient. The important symptoms to which Dr. Brickner has called our attention, the sharp cutting pains, with faintness, should not go unheeded. These taken with the local and general condition of the patient, the pulse, temperature and blood findings, will guide you in deciding between those cases which will go on to a symptomatic cure under conservative treatment, those who must be operated on immediately, and those where later operation is indicated."

DR. WALTER M. BRICKNER, in closing the discussion, said: "I have nothing special to add except to say that the actual cases I spoke of numerically were cases of ruptured pyosalpinx *with diffuse purulent peritonitis*. The number of cases of rupture of a pyosalpinx with a local nonpurulent peritonitis is *very much larger*, and probably there are a great many cases in which there is a progressive rupture of a pus-tube. Whether one can tell that the tube is not going to rupture while the patient is in bed under conservative treatment, I do not know, but I have been told of and have seen a good many cases of localized peritonitis with a tube inside that has ruptured."

DR. GEORGE W. KOSMAK reported

#### A CASE OF PLACENTA PREVIA TREATED BY CESAREAN SECTION.

"I desire to report briefly a case of placenta previa treated by Cesarean section because the treatment in this case was so much more satisfactory than I had hoped for.

"This woman came to the hospital about two weeks ago in the ninth month of gestation. When five months pregnant she developed a small vaginal hemorrhage. The family physician called suspected placenta previa, but did not do anything and her pregnancy went along normally until two weeks ago when she again began to bleed and was put to bed. He did not do any vaginal manipulation, the bleeding soon stopped and she was up and around on January 13. She subsequently had another hemorrhage and was sent to the hospital. The patient was in no shock and her mental condition was good. She had a temperature of 140 and the cervix was one and a half fingers dilated and elongated. The patient was



immediately prepared for operation and a living child extracted by an abdominal Cesarean section. She was up on the twelfth day and ran a nearly normal course of temperature. The slight elevation of temperature present was probably due more to the absorption of blood-clots than anything else.

"The treatment of placenta previa is by no means settled. I think it depends whether the patient is in the hospital or at home. My experience with the treatment of several cases by forcible dilatation, tearing through the placenta, doing a version and extracting the foot, is that it is usually rather unfavorable as regards the child and often the mothers. In every one of these cases I think that the treatment of placenta previa by Cesarean section is much more hopeful and that we get better final results. Of course, one swallow does not make a summer, but this woman made a good recovery and left the hospital on the fifteenth day, and I think we ought to always consider this procedure rather than to invariably resort to other more commonly accepted methods of treatment."

#### DISCUSSION.

DR. E. M. COLIE, JR., in opening the discussion, said: "Dr. Kosmak has said one swallow does not make a summer and it is also true that a single flurry of snow does not make a winter, but in placenta previa if the canal has been packed for the control of hemorrhage it follows that that area is one where thrombi are present, and if at the end of that time the packing is taken out, the placenta is torn across and the child rapidly extracted by version, that thrombosed area is traumatized. I never thought of it until last summer, when one of the best men in the city did a rapid and beautiful version and got a beautiful child but the mother developed a pulmonary or cerebral embolus. I think that one such case as that which I witnessed is enough to make anybody think favorably of a nice, good, clean Cesarean section, with control of the hemorrhage if it occurs, and extirpating the uterus if necessary. Not more than eight months ago a well-known man in this city lost a case from uncontrollable hemorrhage. I think it is a mighty good thing to consider the Cesarean operation in such cases."

DR. W. H. W. KNIPE said: "I would like to ask Dr. Kosmak whether he packed the uterus to prevent postpartum hemorrhage. The cervix and lower uterine segment, where the placenta previa is located, is the thinnest portion of the uterus and with little contractile power and to prevent postpartum hemorrhage in cases of placenta previa in which Cesarean section is done, it would seem wise to pack the uterus just as we would in most cases of placenta previa treated by the vaginal route."

DR. O. PAUL HUMPSTONE said: "These uteri in my experience are different than the average uterus you get in Cesarean section. I was going to ask Dr. Kosmak if the uterus in his case was soft and flabby. In my experience where Cesarean section is done for placenta previa or accidental hemorrhage, the uteri are soft and flabby and they do

not contract so well. I find that the results from pituitrin in these cases are particularly satisfactory in combination with ergot."

DR. GEORGE W. KOSMAK, in closing the discussion, said: "This patient received an injection of 40 minims of ergotol before the incision was made. I have not done very many Cesareans, but I never saw a uterus contract so quickly as this one. We made our incision entirely above the umbilicus and if there is a single case in which I am sorry I did it, it is this one, since the uterus contracted so quickly I had hard work to get it up and sew it. There was very little hemorrhage, either during or after the operation and I did not pack the uterus."

The paper of the evening was read by DR. J. MORRIS SLEMONS, of Johns Hopkins University, entitled:

IS ALBUMINURIA LIKELY TO RECUR WITH SUCCEEDING PREGNANCIES?\*

#### DISCUSSION.

DR. GEORGE L. BRODHEAD, in opening the discussion, said: "In all of the years during which the Sloane Alumni Society has had meetings I think we have never had a more interesting and instructive paper than the one Dr. Slemons has read tonight. It is one of the most stimulating papers I think I have ever heard."

"I have often wondered in my own mind whether a patient should have a subsequent pregnancy and I felt that in a number of cases there would probably be no recurrence, but as to the method of ascertaining whether a patient would have a recurrence or not I had reached no definite conclusions."

"I recall a case, of which I was reminded by the first case which Dr. Slemons reported, which was that of a patient who had had eclampsia during the first pregnancy and when she became pregnant again (she lived in Baltimore) she consulted Dr. Kelly and although the report at that time showed considerable albumin, Dr. Kelly thought she might safely go on with her pregnancy. She came to New York a few weeks later to live and consulted an eminent specialist here who advised her that the uterus should be emptied at once. She was referred to me by the physician whom she consulted next and Dr. Kelly having examined her and having felt she ought to go on, I made up my mind we would allow the pregnancy to proceed. She went through the pregnancy successfully and now has four splendid children. She has gone through four pregnancies with nothing more than a very small amount of albumin and only occasional hyaline and granular casts. Had she been sacrificed in her second pregnancy she would probably have thought that she should never again become pregnant. Of course the outcome might have been different, in which event she would probably have wished she had followed the advice of the New York specialist she consulted."

"The questions that he has brought up in the convalescence, I think, are of extreme importance. I think that in any case of albuminuria where the albumin has cleared up very quickly after

\* For original article see page 849.

labor the prognosis for subsequent pregnancy is extremely good and his statistics and figures would bear that out. Then, again, the point which he brings up about the frequent examination of the blood pressure is also a most important question and it is reasonable to believe that if the albumin persists and if the blood pressure remains persistently high for a period of from three to six weeks following the birth of the child that there probably has been a lesion of the kidney which may in a subsequent pregnancy develop and pregnancy may end disastrously.

"I looked over my records to-day and found that most of the patients having albuminuria went through the subsequent pregnancy without trouble. As Dr. Slemons states, probably four out of five will go through a subsequent pregnancy normally. Of course, primiparæ, we know, are especially liable to trouble and especially so in pregnancy complicated by hydramnion or twins. I recall a patient who had no trouble during two pregnancies but the third was one of twin pregnancy and we had to induce labor at the eighth month because of the large amount of albumin and the toxemia from which she was suffering. Since that time she has had one other child with no trouble whatever. Dr. Slemons has given us a great deal of food for thought, and we are greatly indebted to him for his admirable paper."

DR. O. PAUL HUMPHSTONE said: "Every year from those dark halls, way down at the back of Hopkins, there comes forth some great advance in obstetrics. You may remember the contribution on the funnel pelvis. We hadn't heard much about funnel pelvis until Dr. Williams described how he recognized that pelvis. I think the Society is very fortunate to-night to be the organization to be honored by having this advance from Hopkins come to us first. I am sure it will act as a stimulus to us to investigate this question of prognosis of future pregnancies after eclampsia. It is to be hoped that this article will point the way to a more positive prognosis as to the likelihood of albumin in future pregnancies."

DR. RALPH W. LOBENSTINE said: "This subject, gentlemen, is of the greatest importance to us all.

"The prevailing sentiment seems to be, that "an albuminuria with or without symptoms of eclampsia, in one pregnancy does *not* increase the danger of this complication in a subsequent pregnancy." I believe this statement to be correct. But is this true? Personally, I believe that this teaching is dangerous.

"A patient who, in a given pregnancy, has suffered from a reasonably severe albuminuria or from eclamptic symptoms, is in greater danger in a subsequent pregnancy. This danger depends (a) upon the severity of the original attack, (b) upon the length of time required, after said attack, for complete convalescence. In many of these cases, absolute convalescence is very slow.

"I firmly believe that all such cases should be strongly urged to avoid pregnancy for at least two years.

"Finally, the urine in these patients should be studied for a much longer period after delivery than is usually done."

DR. GEORGE W. KOSMAK said: "I was also very much interested in what Dr. Slemons had to say because lately I have had a considerable number of rather severe cases of toxemia of pregnancy to treat.

"There is one point in connection with the consideration of these cases which we ought to bear in mind. I think the profession at large has depended on albuminuria as an indicator in these cases of toxemia to an extent that is scarcely justified. We get a great many cases of severe eclampsias in which absolutely no albumin has been noted in the urine before the seizure and we are often very much surprised that this serious condition has come out of an apparently clear sky.

"As far as we know or, as far as we don't know, the etiology of eclampsia is probably dependant upon some disorder of metabolism which is as yet uncertain, yet there are other signs in the urine which I think will afford us a warning of the possibility of this condition aside from the mere presence of albumin. In the routine examination of pregnant women it is just as important to pay particular attention to various other decomposition products appearing in the urine, such as indican and acetone. In a number of cases observed in private practice there were symptoms of toxemia that were not unusual, such as headaches, visual disturbances, slight swelling of the face and hands, a high specific gravity of the urine and the presence of marked indicanuria without any albumin being present, and these led me to institute measures which always succeeded in carrying the patient on to full term.

"I want to ask Dr. Slemons if he does not think it is just as important in estimating the prognosis in these cases of toxemia of pregnancy to pay equal attention to the presence of these products of intestinal decomposition as to the finding of albumin.

"I am sure we all are very grateful indeed to him for taking the long trip from Baltimore to furnish us with an evening of intense scientific speculation."

DR. EVERETT W. GOULD said: "The paper of the evening is particularly interesting to me in connection with a case which has been under my care recently. This was a patient, a multipara, who came to me only a week before she was due. She then had marked traces of albumin in the urine, increasing within a couple of days to 2 grams to the liter, and showing many hyaline and granular casts. I sent her to the hospital for closer observation. Her blood pressure was 185 to 190 but after thorough cleansing of the bowels and proper diet for two days the blood pressure came down to 140 and I gave her large doses of castor oil which started the pains. In a few hours delivery occurred without any symptoms whatever and I felt very much relieved. On the third day she had considerable headache and that night on nursing the child she had a convulsion and fell out of bed. She then had seven or eight convulsions during the succeeding twenty-four hours. The blood pressure was 190 to 200. She was comatose for three days and blood pressure ranged from 180 to 200. With the use of the Murphy drip hot packs, irrigations and chloral the pressure came down to

160 to 150. She woke up on the third day perfectly happy and smiling, and on the next day her pressure had come down to 130. This was two weeks ago and her only trouble now is that she wants to go home. Her blood pressure is apparently normal, and her urine shows only a trace of albumin with a few hyaline casts. This would seem to be a case of eclampsia, not of nephritic origin primarily and therefore the prognosis, according to Dr. Slemmons, should be very good for future pregnancies."

DR. FREDERIC O. VIRGIN said: "I think an honest confession is often good for the soul. I feel in regard to what Dr. Slemmons has said to-night that in my own answer to the questions that have been put by patients coming back from sad experiences, the wish has rather been father to the thought. I shall find myself guilty if after this time I have not watched the urine for weeks afterward and followed the blood pressure, but I am frank to admit that I shall not attempt an examination of the blood. I think we have learned a lesson not that we can always tell what is going to happen, but we are at fault if in our work we do not follow out the suggestion Dr. Slemmons has given to us in regard to the watching of these patients for a considerable period of time after they are delivered."

DR. J. MORRIS SLEMONS, of Baltimore, in closing the discussion said: "There is, probably, no obstetrical problem so hazy as that of the toxemias of pregnancy. I believe you will agree with me that there is a great need for us to agree upon some sort of a classification in these cases of autointoxication, for otherwise investigative work will not count for the most. The basis of this classification should be a pathological one for it is the simplest, the least confusing, the most fundamental, and the most reliable. Let us accept such a classification, even though it be tentative, as a sort of working hypothesis. If the results of our researches do not fit in with it, then we shall be willing to give it up.

"I agree with Dr. Kosmak that there are cases of toxemia of pregnancy in which the intestines are primarily at fault. As yet, however, the group is not well defined. The pathognomonic symptoms are not clear, and no one can say just what the immediate effect of such an autointoxication is nor what are the chances of recurrence in successive pregnancies.

"Dr. Lobenstine has brought out an important point, one that I did not care to discuss in my paper because my experience has not been broad enough to warrant definite conclusions. We must learn what effect the length of the interval between pregnancies has upon the recurrence of autointoxication. My own experience with cases of eclampsia indicates that the disease is less likely to recur if the interval between pregnancies is not a long one.

"In conclusion I should like to add that it has been a great pleasure to be here. I have thoroughly enjoyed the discussion and wish to thank you for permitting me to take part in it."

## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON OBSTETRICS AND GYNECOLOGY.

*Meeting of December 26, 1912.*

FRANKLIN A. DORMAN, M. D., *in the Chair.*

#### MULTIPLE FIBROMA WITH ADENOCARCINOMA OF THE FUNDUS UTERI.

DR. W. TRAVIS GIBB reported this case. He stated that the patient from whom the uterus was removed was fifty years of age, married, and had one child. She had always had more or less uterine disturbance and the menstrual function had been irregular. In 1911 she flowed so profusely that she was confined to bed for weeks at a time from April until October. No attempt was made by the attending physician to ascertain the cause of the uterine hemorrhage and the treatment consisted of the internal administration of ergot and stipticin.

When Dr. Gibb first saw the patient she had been flowing continuously for several months. Examination revealed a uterus reaching several inches above the symphysis and the seat of several subserous and intramural fibroids. There was also a large polypoid mass in the interior of the uterus which bled very readily. The patient was very stout with thick abdominal walls and had had a previous laparotomy. She was exceedingly anemic. As the uterus was too large to be removed through the vagina and it did not seem wise to risk a suprapubic hysterectomy at that time, the uterus was emptied of a polypoid growth the size of a large orange which was attached to the fundus near the right cornu. Microscopic examination of this growth showed it to be an adenocarcinoma.

The patient made a quick recovery and the uterus reduced in size so rapidly that a week later a vaginal hysterectomy was performed. The microscopic examination of the tissues surrounding the attachment of the carcinomatous mass indicated that the cancerous infiltration had not extended through the uterine wall. The patient's recovery from the second operation was uneventful.

This case was of special interest in that it was an example of what was occurring every day. The patient was suffering from a very distressing condition and was willing to undergo any examination and to do anything that the physician might suggest for her relief, but he allowed her to go for two years without making any real effort to ascertain the cause of this most unnatural condition. Two very valuable years were lost in her treatment. Fortunately for her



the cancer was one of very slow growth and extension and very amenable to surgical treatment. Two years ago one could almost have promised the woman that no recurrence of the growth would take place after the uterus had been removed, but at this late date although the microscopical examination showed that the growth had not extended beyond the uterine walls, the danger of recurrence in the pelvis or by metastasis was very great.

Malignant disease of the uterus accompanying or complicating uterine fibroid was of much more frequent occurrence than was generally believed a quarter of a century ago. At that time it was a pretty generally accepted idea that the presence of uterine fibroids was proof that cancer was not present and would not develop in the uterus. The able papers of Cullen, McDonald, Piquard, and Winter during the past ten years have made us realize that malignancy frequently accompanies uterine fibrosis, so frequently, in fact, that we are justified in removing all fibromyomatous uteri, especially in women over forty years of age, as soon as they are diagnosed, to prevent the development of malignancy. Malignancy in connection with uterine fibrosis occurred in about 5 per cent. of women between forty and fifty years of age; in about 12 per cent. of those between fifty and sixty years of age, and in about 23 per cent. of those between sixty and seventy years of age. Such statistics should lead them to choose a panhysterectomy in these cases rather than the easier supravaginal operation, not only because a minute cervical fibroid may exist unnoticed at the time of operation and develop later on but because there was danger of the development of malignant disease in the cervical stump if that were not removed.

#### DOUBLE PYOSALPINX OF LARGE SIZE.

DR. W. TRAVIS GIBB reported this case. The patient from whom the specimen was removed was thirty-four years of age, married seventeen years and never pregnant. She had been ill practically since her marriage, had been curetted twice, had worn pessaries and had undergone many courses of treatment. Both she and her husband denied any venereal disease. Recently she had been ill for several weeks and confined to bed for a day or two with a sharp attack of peritonitis. Her abdomen was enlarged and tense with a well-marked mass in the right iliac fossa, apparently extending four or five inches above Poupart's ligament and well over toward the median line. This mass was rounded, exquisitely tender, and appeared to be directly continuous with a fluctuating mass filling the culdesac. The mass was diagnosed as a pelvic abscess and preparations were made to remove it per vaginam and await a more favorable time for removing the diseased tubes.

Examination under complete anesthesia showed the mass in the right iliac region to be distinctly separate from the mass in the culdesac and fairly movable in the abdominal cavity. An abdominal operation was then decided upon and through a median incision a large mass presented, covered with thickened and inflamed omen-

tum. The latter was adherent to the parietal peritoneum. The mass was firmly adherent to the surrounding intestines, the whole of the pelvic and lower abdominal contents being firmly matted together by old adhesions. Attempts to enucleate the upper mass were followed by a free escape of pus, perforation having occurred in several places. When the mass was separated and lifted out of the incision it was found to be the right Fallopian tube and an enormously enlarged ovary. The tube was over 12 inches long and  $3\frac{1}{2}$  inches in diameter at its fimbriated extremity. The ovary was about 4 inches long. Before removal the tube reached for a considerable distance above the umbilicus. The omentum was so firmly adherent to the tube that portions of it had to be ligated and removed with the tube. Several knuckles of intestine were so adherent to the tube that rupture of the tube into the intestines had undoubtedly occurred during previous attacks. In separating these adhesions the gut was torn through in several places necessitating extensive repair. The left tube and ovary were firmly imbedded and adherent in Douglas' culdesac. They too were enormously enlarged—but not as large as the left—and were removed with difficulty.

This woman undoubtedly had had many attacks of pelvic and general peritonitis due to gonorrheal tubal infection, some of them terminating in the rupture of the tubal abscess into the intestine, and it was difficult to understand how the tubes and ovaries could have been allowed to grow to such an enormous size without operative interference.

#### RUPTURED INTERSTITIAL PREGNANCY.

DR. GEO. G. WARD, JR., reported this case, the history of which was as follows:

Mrs. K. H., age twenty-seven. Married five years. Menstrual history perfectly normal before marriage. Family history, negative. Shortly after marriage became pregnant. When six weeks over her time an abortion was induced by a midwife. Five days later said she "caught cold" in her pelvic organs, and had a resulting peritonitis, which nearly cost her her life. After recovering from this sepsis her menstrual function became normal. She had no further pregnancy until four months ago. Date of the last menstruation being August 4, 1912. Throughout this gestation she was perfectly normal, with no pain or spotting whatsoever. She had the usual morning sickness. Her pregnancy was apparently normal and progressing in the usual manner. On the evening of November 28, she went to the theater and while laughing heartily, had a sudden severe pain in the region of her uterus, which lasted about five minutes. Recovering from this, she went out to supper after the theater and as usual to bed, sleeping normally until seven o'clock the next morning, when she was seized with a severe pain in the same situation as the night before but very much worse and she nearly fainted. This pain was situated in the region of the fundus of the uterus, and as it continued to increase in severity her family

physician was called and on recognizing the seriousness of the condition, he advised her immediate removal to the hospital, and at 10 A. M. she was removed in an ambulance to the Post-Graduate Hospital. Her condition was very fair until the ambulance nearly collided with a trolley car, when the sudden jar and shaking caused her to go into immediate collapse. Undoubtedly the fetus was expelled at that time into the abdominal cavity. On reaching the hospital, she was brought immediately to the operating room, at which time she showed every evidence of severe internal hemorrhage, being pulseless at the wrist. An intravenous saline infusion was started immediately, and the abdomen was rapidly prepared with iodine. On opening the abdomen I found the cavity entirely filled with fresh blood and clots and found a four months' fetus loose among the intestines and the uterus showing a large rupture at its right cornua. A rapid supravaginal hysterectomy was made, the abdomen cleaned of clots and the wound closed. The time consumed being thirty minutes from the time she was brought to the operating-room until she was removed to her room. For twenty-four hours her condition was precarious, the pulse being imperceptible at times. Rectal saline enemas were given frequently and also the Murphy drip. Transfusion of blood was seriously considered but as her condition began to show signs of improvement it was not found necessary. The day after the operation, a blood count showed 40 per cent. hemoglobin, and 2,800,000 red cells. She made a rapid recovery and was sitting up on the fourteenth day.

The specimen which I present shows very well the development in the right horn of the uterus and the intact tube beyond. Any cases of interstitial pregnancy are of sufficient rarity and interest to be reported. According to Rosenthal the interstitial variety is the rarest, occurring in only 30 per cent. of the 1324 cases of ectopic pregnancy. Weinbrenner collected only thirty-five cases up to 1904. Martin and Orthmann found only one interstitial in fifty-seven ectopics.

Among the special points of interest in this case were the following:

First, points bearing on the etiological factors. After she was married and became pregnant she attempted to rid herself of her pregnancy and this probably was an etiological factor in the production of the ectopic gestation.

Second, she had no symptoms during her four months' pregnancy that would lead one to suppose there was a pregnancy other than in the uterus. There was no spotting and no pain. The uterus was enlarged to what would be expected when there was a four months' pregnancy *in utero*. He could not say how they were going to guard against such calamities.

Third, the question arose, why did he remove the uterus? Dr. Ward thought this was a fair question. At the time of operation the woman was so nearly dead, pulseless, abdomen filled with blood, and in shock and everything had to be done with great rapidity and there was no time to be lost and, therefore, he got it out as soon as possible. He believed he was able to do a quicker operation by

doing a supravaginal amputation and so removing the bleeding areas. When one realized that the ectopic was in the horn of the uterus he should remember that the hemorrhage came not only from the ovarian vessels but from the uterine vessels as well. Therefore to make sure of stopping the bleeding, and in the quickest time, he removed the organ. She made a good recovery.

#### DISCUSSION.

DR. FRANKLIN A. DORMAN asked Dr. Ward if an expert had examined a woman with such as ectopic before rupture, could he obtain any hint as to the true condition by discovering some irregularity. In his judgment would the discovery of any such irregularity suggest such a condition existing.

DR. DORMAN remembered one case in the service of Dr. West seen at the Post-Graduate. There were tremendous explosions of this sort in an undeveloped horn. The operation verified the diagnosis and it was similar to the case reported by Dr. Ward.

DR. GEORGE GRAY WARD said that it would seem to him that in an examination made by an expert, that it was possible, if the case was examined carefully and the abdominal walls were not too thick, to detect any irregularity which might exist. In this instance the ectopic was in the horn of the uterus. Careful bimanual examinations were not always made. He believed that it was excusable not to recognize the condition under the circumstances. In some instances, however, a careful examination would reveal irregularity.

Dr. Ward remembered one other case of interstitial pregnancy which was reported before the New York Obstetrical Society by Dr. Vineberg a year or two ago. The top of the uterus appeared as if it had been blown off by a shot-gun. In the ordinary tubal pregnancy severe hemorrhage with collapse was not so common and often one waited until the following morning to operate, but in the interstitial variety the hemorrhage was apt to be of the most severe type.

DR. GEO. W. KOSMAK showed a picture of the case of Dr. Markoe's that was reported to the Section last winter. In this case there were preliminary symptoms of bleeding and no rupture.

DR. WILLIAM H. WELLINGTON KNIPE would like to believe that they could make a diagnosis of these cases by the discovery of these irregularities of contour. The text-books state that a pregnant uterus should be smooth and round, but they frequently met with uteri which were neither smooth nor round. During the early months he was quite sure he would hesitate in making a diagnosis of pregnancy of the type under consideration just because of a little irregularity of the uterus. He saw many cases with irregularities and in a normal pregnancy. He did not believe that they could make a positive diagnosis merely by an abdominal examination. One might have a symptomless patient; an abdominal as well as a vaginal examination might be made and if such a diagnosis of intramural ectopic was made he believed it was guess work. These

irregularities of contour in his opinion were not so important in establishing a diagnosis as some thought them to be.

#### SARCOMATOUS DEGENERATION OF A UTERINE FIBROID.

DR. L. J. LANDINSKI. The patient was forty-six years of age and married. Her family history was negative. Her health had always been good until the last four years during which she had been losing weight and strength. There was nothing unusual in her menstrual history. Her last period was five weeks before admission to the hospital. She had been married twenty-five years, had seven children and no miscarriages. Her first pregnancy was twenty-three years ago and her last eight years ago. During the last four years menstruation had been regular but very painful, profuse, and of eight to ten days' duration. She had not menstruated for ten weeks when she started in five weeks previous to her admission and bled very profusely. She had continued to bleed until one week before. During this time she passed clots and had very severe pain. Urination was normal, but the urine showed a trace of albumin. The patient complained of headaches.

A vaginal hysterectomy was done at the Beth Israel Hospital on October 11, 1911.

The report of the pathologist, Dr. Eli Moschowitz, showed sarcomatous degeneration of the uterus.

#### ADENOSARCOMA OF THE CERVIX FOLLOWING SUPRAVAGINAL HYSTERECTOMY FOR FIBROIDS.

DR. L. J. LADINSKI. A woman forty-three years of age had been married twenty-four years. She had had no children and no miscarriages. She had menstruated regularly until February, 1910, when a supra-vaginal hysterectomy was performed for fibroids of the uterus. In September, 1910, she was referred to Dr. Ladinski because of severe pain and difficulty in urination and defecation. Upon examination the cervix was found to be normal, and a large mass the size of an orange was found occupying the place of the uterus and extending principally to the right. The mass was immovable and somewhat tender to the touch. Assuming that the tumor was a fibroid that had developed from a small one overlooked in the cervix at the time of the previous operation, the case was diagnosed as one of fibroid and operation was advised.

Upon opening the abdomen a mass was found adherent to the omentum and appearing to spring from the stump of the cervix. It was somewhat adherent to both the rectum and the bladder. The tumor was shelled out and the cervix removed and the patient made an uneventful recovery.

The macroscopic and microscopic description of the tumor furnished by the pathologist, Dr. Eli Moschowitz, as follows: "The larger tumor, of the size of an orange, has an irregular nodular

surface, brownish yellow in color and of rather firm consistency. Fatty bands like portions of omentum, are firmly attached to the greater part of its surface. Grossly the tumor resembles a degenerated sloughing fibroid. On cross-section the surface is yellowish and irregularly lamellated.

The frozen section showed a papillary adenocarcinoma. This was confirmed by section of the hardened specimen. It was then seen that there were signs of very active proliferation. The invasion of the carcinoma had extended into some of the attached omental adhesions.

The smaller tumor was irregular, of firmer consistency and showed on microscopical examination that the cervical glands were involved.

The patient had gained about 20 pounds since the operation and was in splendid physical condition at present.

The interesting features of this case were the coexistence of fibroid and carcinoma, and the question of the possible causative relations between the two conditions.

The topic for the evening's discussion was

#### MALIGNANT DEGENERATION ASSOCIATED WITH FIBROMA UTERI.

##### DISCUSSION.

DR. DORMAN asked what was to be the attitude of the gynecologist toward a woman with fibroids of the uterus and should the uterus be entirely extirpated. Until recent years few recognized the considerable possibility of malignancy occurring in these tumors. During the early days of his practice it was thought best to wait until the menopause before interfering, especially in the cases with menorrhagia.

DR. WARD said that the subject under discussion was interesting to all operators who wanted to know whether or not it was better to leave the cervix. Abroad during the last two or three years there was a strong leaning toward curing these fibroids by means of the x-ray. He had been abroad last summer and saw the method demonstrated. In some of the clinics the x-rays were relied upon almost exclusively to stop the progress of the disease and to relieve the symptoms except in those cases where the tumor was submucous. The women who had not the time nor the means to take the treatment which was a matter of two or three months were the only ones operated upon in some clinics. At König's clinic in Freiburg, the women of the wealthier class coming to Freiburg would not have the operation. The theory was that the x-rays put the ovaries out of business; they also caused the myoma to shrink, the blood-vessels to atrophy and the symptoms to disappear.

When asked: "What about the danger of malignant degeneration in these tumors?", they admitted that 10 per cent. of fibroids showed degenerative changes of a malignant nature. If one out of ten showed these changes we should seriously consider whether it was worth while to use this expensive treatment with the x-rays.



Dr. Ward stated that more care should be exercised in making sure that the growth removed was not malignant at the time of the operation and should not jump at the diagnosis without cutting open the growth. He recalled one case seen seven or eight years ago, where he operated upon a characteristic fibroid of the fundus. A supravaginal hysterectomy was performed. After the patient had been returned to the ward, the tumor was opened up and found to be adenocarcinoma. Fortunately there had been no recurrence thus far. If he had opened up this tumor when the woman was on the table he would not have left a portion of the uterus *in situ*. It was one's duty now to open up these tumors in the operating room.

DR. KNIPE recalled a case seen some years ago in which a supravaginal hysterectomy was performed for a large fibroid. About four months later he was called to see the patient and, at that time, he found the pelvis filled with a mass which was so hard that he thought that he had to deal with a fecal impaction. The use of enemata did not dislodge the mass. He finally made a diagnosis of malignant disease of rectum and sigmoid and made an artificial anus. At the time of the hysterectomy they did not suspect this condition; the broad ligament was filled with large varicose veins. In such cases he believed the safest plan was to consider the condition a malignant one and to do an extensive operation.

With regard to degeneration of fibroids into cancers, possibly there were two opinions on this subject. He had recently read a great deal on this subject because of the considerable work on tumors that he had done in the laboratory. He recalled distinctly a case in which it was thought possibly there had occurred malignant degeneration of a fibroid tumor and he consulted Dr. Prudden who made the statement: "These never degenerate into cancers." His own opinion leaned to Dr. Prudden's ideas. In case of malignancy, the cause might not be independent of the fibroid, but due to the irritation set up by the presence of the fibroid; and the malignancy is an associated, concomitant condition and not merely a degeneration of a fibroid tumor itself. He had never seen a case in which a fibroid nodule had been converted to a malignant tumor *per se* or read of one that had been proven so to his satisfaction.

DR. M. RABINOVITZ had listened with pleasure to the remarks made on the malignant degeneration of fibroids of the uterus. His experience taught him that less than one in ten degenerated; therefore in his opinion it was impossible to lay down any fixed and fast rules, as when to do a myomectomy and when a hysterectomy. He thought that the age of the patient and her social position should be taken into consideration. If a woman, a multipara, was in the prime of life and desired more children, or a nullipara in whom the fibroids were the cause of her sterility, what was advocated as the safer and most proper procedure was a myomectomy although it might at times be more difficult to perform than a hysterectomy. In women, approaching the fourth decade and who could not be under observation, hysterectomy is the better plan. Only recently

in one of his cases the question came up whether to do a hysterectomy or a myomectomy. The latter operation was performed, the woman became subsequently pregnant and went on to a normal delivery.

As to the question of degeneration of fibroids, he had observed that the degeneration is limited to the tumor and only exceptionally does it extend to the uterus. Furthermore the microscopic evidence is not always born out clinically. He had in mind two cases that he had seen in the last two years. One was a woman, twenty-six years of age, married one year, and the subject of a very severe endocarditis. He was called to see this patient because of a uterine hemorrhage, the bleeding being very profuse, he thought it was advisable to curet her, which he did. The pathologist's report on the scrapings was that of an adenocarcinoma. He told the patient that it would be better if he removed the uterus. She objected to this. It is now over nine months and no symptoms of malignancy have developed as yet, her menstrual periods are fairly normal and not profuse.

The second case was one of metrorrhagia and the scrapings showed that there was an adenocarcinoma present. However, the patient died of some intercurrent disease. The uterus was obtained post-mortem and many sections were made but no carcinomatous changes were to be found except in the curettings. The nature of the operation to be employed in cases of uterine fibroids will depend upon:

(a) The clinical findings, *i.e.*, the location, size and number of the fibroids.

(b) The age of the patient, below or above the third decade.

(c) Her social standing, that is whether she can be kept under observation after a myomectomy.

DR. DORMAN said that one of his colleagues had told him that he had met with two or three recurrences in the cervical stump. As a result that man employed retention of the stump with excision of the cervical mucosa. One should safe-guard his patients, however, and often a panhysterectomy was the operation to be preferred. If as reported 10 per cent. of these cases become malignant, this operation he believed gave them a better chance.

DR. W. TRAVIS GIBB thought there had been a great deal of talk about adenocarcinoma of the fundus. This was of slow growth. He had in mind a case that was operated upon eighteen years ago and whether she had a degenerated fibroid or not he did not know. The patient was a doctor's mother and fifty-four or fifty-five years of age. In cureting her, the curet went through into the abdominal cavity and he removed the uterus. He saw her eighteen years after. In these cases where the fundus was involved he believed the cervix should be removed, because it might become the foci for further involvement. Even when the fibroids are very small this should be the course to follow. All had seen cases in which these small fibroids had been overlooked and, for that reason, he believed a panhysterectomy was the best operation. He thought that the proportion of cases which developed malignancy was very large. Greater care was taken to-day in making a diagnosis than was

taken years ago and he thought that many of the cases seen in the past were carcinomatous at the time of operation.

ELECTION OF OFFICERS FOR 1913.

*Chairman*, DR. GEORGE GRAY WARD, JR.

*Secretary*, DR. GEORGE W. KOSMAK.

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ITEMS.

CLINICS, DEPARTMENT OF PUBLIC CHARITIES

*Calendar for May, 1913.*

Kings County Hospital (Brooklyn).—Gynecology, Dr. McNaughton, Mondays 9:00 A. M.

Cumberland St. Hospital (Brooklyn).—Gynecology, Dr. Burnham, Tuesdays, 1:00 P. M.

Kings County Hospital (Brooklyn).—Obstetrics, Dr. Commiskey, Tuesdays, 10:00 A. M.

City Hospital.—Obstetrics, Dr. Shears, Wednesdays, 2:00 P. M.

Coney Island Hospital.—Pediatrics, Dr. Beck and McQuillan, Wednesdays, 3:30 P. M.; Pediatrics, Drs. Pendleton and Van Wart, Wednesdays 3:30 P. M.

City Hospital.—Gynecology, Dr. Stearns, Thursdays, 2:00 P. M.

Cumberland St. Hospital (Brooklyn).—Gynecology, Dr. Burnham, Thursdays, 1:00 P. M.

Kings County Hospital (Brooklyn).—Obstetrics, Drs. Commiskey and Judd, Thursdays, 10:00 A. M.

Coney Island Hospital.—Gynecology, Drs. McEvitt and Mills, Thursdays, 10:30 A. M.; Gynecology, Drs. Mayne and Ranken, Thursdays, 10:30 A. M.

Kings County Hospital (Brooklyn).—Gynecology, Drs. McNaughton, Fridays, 9:00 A. M.

Kings County Hospital (Brooklyn).—Obstetrics, Dr. Commiskey, Saturdays, 10:00 A. M.

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CORRECTION.

The illustration on page 689 of the JOURNAL for April does not belong to Dr. Sellman's paper, but to the paper by Dr. H. S. Lott, in this issue.

## REVIEW.

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THE PRACTICE OF UROLOGY. A Surgical Treatise on Genito-urinary Diseases including Syphilis. By CHARLES H. CHETWOOD, M. D., L. L. D. Professor of Genito-urinary Surgery, New York Polyclinic; Visiting Genito-urinary Surgeon to Bellevue Hospital. 824 pages, large octavo. Profusely illustrated by line and half-tone cuts and by six full-page colored plates. Price \$5.00 muslin, \$6.00 half-morocco. William Wood & Company, New York, 1913.

This book is a valuable addition to the literature on this important branch of surgery, and is peculiarly adapted to the needs of the student, general practitioner and specialists, for the reason that it affords a ready reference to all that is new and scientific pertaining to urology and syphilis, tempered throughout by a conservatism which is borne of long and active experience in the field of genito-urinary surgery. The systematic and convenient arrangement of the chapters, the preparation for, and technic of the performance of the various operations, supplemented by a list of instruments necessary for each, are features which will be at once appreciated. The subject matter contains references to many new and important developments, which have been thoroughly tested and not found wanting, fads and prejudices being conspicuously absent, so that the reader may look with confidence for the very latest and best means of diagnosis and treatment, feeling certain that he will not be led astray by enthusiasm over methods of unproven value. The chapters on serodiagnosis and vaccine and serotherapy in syphilis and gonorrhea deserve special mention, and are of great practical worth to both general and special practitioner.

Remarkable advancement has been made in renal surgery within the past few years, due mainly to the facilities afforded by the functional tests, pyelography, radiography and cystoscopy. These technics, and the interpretation of their findings, are tersely and clearly explained. The addition of actual photographs taken by the author, and of two handsome colored plates, render this important subject illuminating.

Gonorrhea, acute and chronic, with its sequelæ, is dealt with in a masterful and complete way such as long experience alone can produce. All the various phases of this dread disease are thoroughly discussed in a most comprehensive and convincing manner.

Prostatic hypertrophy, contracture of the vesical orifice and vesical neoplasms have been given careful consideration at the author's hands, conservatism being the keynote of all phases of the treatment of these important maladies. Emphasis is laid upon the advantages to be gained from special technic in selected cases.

The chapters on syphilis and its most modern treatment are timely: had they been excluded, the book would have been incomplete. The author's views on the advisability of including this subject are forceful, convincing, and to the point, and, one might well say "the last

word" on this mooted question. He says: "This is done because of the demand for it: for while this far-reaching disease is equally claimed by all departments of medicine, its treatment at the present day is surgical, and cannot be undertaken properly, except upon careful surgical principles." This refers particularly to the administration of salvarsan and neo-salvarsan, the indications for and application of which are lucidly set forth in a style whose simplicity will appeal to its many readers. The salient feature of the book is that the largest amount of information is imparted in the fewest possible words, and always with a view to its value in actual practice.

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## BRIEF OF CURRENT LITERATURE.

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### OBSTETRICS.

**Birth Fractures of the Humerus.**—E. D. Truesdell (*Bull. Lying-In Hosp.*, 1912, viii, 199) records eleven cases of this accident occurring within a year, all but one taking place during breech extraction. Study of these cases shows that union is certain and prompt in birth fractures of the humerus; complicating injuries are usually insignificant; lateral displacement even if marked is not unfavorable; and angular deformity should be guarded against or corrected when it occurs if possible, but where unavoidable and even when excessive, nature will do much to remedy the defect during the first few years of life, effecting a final result never possible under correspondent conditions in an adult patient.

Commenting upon these cases, G. W. Kosmak says that an early diagnosis of the exact position of the arms of the child, before the body was born, together with a correction of the same if necessary, tends to obviate the production of fractures. As soon as the umbilicus is born in a breech extraction with or without a previous version, the fingers of the examining hand should be introduced over the posterior vaginal commissure and the position of the arms determined in relation to the head. If they are extended, or one is caught behind the neck in the form of a nuchal hitch, it is much easier to sweep them over the face into a position of flexion and final delivery, than it is to attempt this maneuver after the greater portion of the trunk including the thorax, is born.

**Experimental Study of the Placenta.**—This was undertaken by R. T. Frank (*Surg. Gyn. and Obst.*, 1912, xv, 558) to determine whether any differences existed in the ferment content of the of the functioning, as compared with that of the nonfunctionating placenta. His experiments show that a large part of the ferment found in the placenta is accounted for by the contained maternal and fetal blood. The ferment values of the placenta approach those of the uterus approximately, but fall far below those of the liver. Changes in function are not accompanied by any change in the ferment content sufficient to be demonstrated by the methods used. Even small fetuses contain an appreciable amount of ferment. The

organs of large fetuses have high ferment values, which sometimes exceed those of similar organs in the mother. This study was supplemented by "vital" staining with 'trypanblau'. Macroscopically the uterus was found to take the stain first; next in order was the yolk membrane and last the placenta. Macroscopically no difference in the depth of staining could be noted in the placenta of live and recently killed fetuses. Those placenta which were well on the way to absorption (old), accepted less color. Microscopically the yolk entoderm cells of functioning, vegetative, and old placenta could not be distinguished. All showed numerous and equally distributed granula. In the vegetative placenta the granular structure was almost entirely lost. The stain was diffuse. The loss of granula occurred first in the placental labyrinth and next in the cell mantles surrounding the maternal blood-vessels. Of similar types of cells those farthest removed from the maternal blood-vessels showed degenerative changes first. Stained with hematoxylin-eosin many of these placenta appeared normal. The 'Sudan' stain showed that in vegetative placenta the fat accumulated chiefly in the cells about the intraplacental maternal blood-vessels, the placental labyrinth containing less fat than that of functioning placenta. The kidneys of five live fetuses were macroscopically blue. Microscopically they showed the same selective distribution of granula as in the maternal kidney. The livers also showed acceptance of the dye. The cervical lymph glands of one of these fetuses were also blue. The writer's general conclusions are that the placenta does not show any parallelism between its ferment values and its functional condition. Changes in the minute structure of the placenta, as shown by "vital" staining, are dependent upon the nutrient supply of blood furnished by the mother. The fetal membranes possess a considerable degree of independence and maintain their function unchanged much longer than the placenta. The fetal membranes are more rapidly traversed by certain substances than is the placenta. Whether exchange effected by this route is of importance to the fetal metabolism was not determined. The evidence obtained in this investigation favors the view that the placenta is a passive organ for exchange, rather than an active organ of metabolism.

**Significance and Treatment of Sugar in the Urine during Pregnancy.**—H. Williamson (*Clin. Jour.*, 1912, xli, 97) says that a trace of lactose is common during the latter weeks of pregnancy, and indicates merely premature mammary activity but has no further significance clinically. After delivery, whenever the breasts become engorged lactose is present in the urine, and when the distention of the breasts is relieved the lactose disappears. Alimentary glycosuria results from the ingestion of an excess of carbohydrates. Transient glycosuria of pregnancy occurs in some women. Glucose is found in their urine and is not materially affected by diet, yet disappears after pregnancy terminates to recur only in subsequent pregnancies. The symptoms of true diabetes usually become aggravated about the sixth or seventh month. Twenty-five per



cent. of cases of true diabetes die within twenty-four hours of delivery, and by the end of two years another 25 per cent. of them have died. If sugar is present in the early months of pregnancy, or if it persists in considerable quantity in spite of diet, or if there is marked increase in the appetite and much thirst, or if acetone and diacetic acid are present in the urine, the case is probably one of true diabetes. If these evidences of true diabetes are present, pregnancy should be terminated. Chloroform should never be administered in these cases; acidosis is a marked feature of chloroform poisoning, and it is dangerous to increase the intensity of the acidosis already existing. If any anesthetic is required ether should be given.

**Blood Pressure in Toxemias of Pregnancy.**—D. J. Evans (*Monthly Cyclo. and Med. Bull.*, 1912, n. s. xv, 649) has studied the blood-pressure in thirty-eight cases of pregnancy complicated with eclampsia. He concludes that the blood-pressure record is of little value as indicating the degree of toxemia present in cases of vomiting in pregnancy. Further observation would show that in this class of cases the blood-pressure falls below normal. A comparatively low reading is obtained in many cases where the symptoms indicate the presence of a very considerable degree of toxemia. In three cases induction of labor was imperative, though the blood-pressure was 150 millimeters, or under. In four cases with a blood-pressure exceeding 150 millimeters the toxic symptoms were so slight that the cases were permitted to go to term, and were delivered after natural labor. The writer considers the danger limit as 160 millimeters. In cases where, in spite of treatment, the toxic symptoms do not yield and the blood-pressure is maintained at or above this point, labor should be induced. In cases of pregnancy with high blood-pressure without toxic symptoms, there is little occasion for anxiety. In all cases of pregnancy with hepatic or renal insufficiency the blood-pressure should be carefully observed. A rising blood-pressure in these cases, associated with other toxic symptoms, is indicative of danger, and 160 millimeters of pressure is the danger limit.

**Pernicious Vomiting of Pregnancy.**—According to J. W. Williams (*Jour. Obst. and Gyn. Brit. Emp.*, 1912, xxii, 245), the underlying factor in all cases of vomiting of pregnancy is probably an imperfect reaction on the part of the mother to the growing ovum. In most cases this is only a predisposing cause, while a reflex or neurotic influence is the exciting factor, and cure usually follows its removal. The writer holds to the classification of reflex, neurotic and toxemic vomiting. Of these the neurotic is the most and the reflex the least frequent type, while the toxemic is the most serious. Pronounced toxemic vomiting is accompanied by characteristic lesions and profound changes in metabolism. The significance of a high ammonia coefficient is not specific. It may be a manifestation of toxemic vomiting, of starvation following neurotic vomiting, or of an acidosis due to various causes. It should be regarded merely as a danger signal, while the differentiation between the various types is possible only after careful clinical observation. If improvement does not

promptly follow appropriate treatment, the existence of toxemic vomiting should be assumed and abortion promptly induced. In the absence of genital lesions, a low ammonia coefficient indicates neurotic vomiting, which can be cured by suggestion and dietetic treatment, no matter how ill the patient may appear. In primiparous women vaginal hysterotomy is the most conservative method of emptying the uterus. Nitrous oxide gas or ether should be used in preference to chloroform for anesthesia.

**Postconceptional and Hereditary Syphilis.**—Jean Bobrie (*Étude sur la Syphilis*, etc., Paris, 1912) gives the following conclusions from his study of postconceptional syphilis and heredity of syphilis. In the absence of all treatment we may find placentas that are macroscopically healthy along with children evidently syphilitic. Nevertheless, maternal treatment has a marked effect on placental hypertrophy. The gravity of the syphilis of the fetus bears no relation to the hypertrophy of the placenta. Hydramnios is exceptional. At whatever time of pregnancy the maternal chancre is contracted the fetus is still infected. The degree of infection varies with the time of infection: the maximum gravity, causing macerated fetus, is at the third month; the gravity then decreases. The fetus never receives a true immunity; while there may be no evidence of syphilis the disease is still present in a latent form. Postconceptional syphilis is more serious for the existing pregnancy than for a later one. The fetus is always infected long before the roseola appears: infection occurs as soon as the mother has been attacked by the chancre. The most effective treatment is mercury in the form of soluble salts or pills; gray oil and salvarsan have not so good an effect by far. Hereditary syphilis can only be transmitted to the fetus by way of the placenta: the spermatozoon which contains a treponema cannot fecundate an ovum. Exceptions to Colles' law are not true. Mothers who do not show syphilitic lesions are still infected, the syphilis being latent. Heredodys trophy is a consequence of syphilis, but not syphilis itself; such infants can become infected by syphilis, and it is then transmissible by the germinative cell only.

**Hemolytic Streptococcus and Puerperal Septicemia.**—A bacteriological study of 103 labor cases by W. J. Walton and L. S. Medalia (*Surg., Gyn. and Obst.*, 1912, xv, 682) shows that both hemolytic and nonhemolytic streptococci are present in the parturient canal during pregnancy before any digital examination has been made. The presence of the hemolytic streptococci is the exception, not the rule. Nonhemolytic streptococci are twenty times as frequent as hemolytic in the secretions of the pregnant. Hemolytic streptococci are found in afebrile as well as febrile parturient cases, and the nonhemolytic are discovered in both types of cases. The frequency of positive findings postpartum of the nonhemolytic is far above that of the hemolytic type, being twice as many (17 to 9). Schottmüller's blood-agar method is of practical value in detecting the hemolytic property of the streptococcus. The hemolytic property is a characteristic of one type of the streptococcus group. Hemoly-

sis as applied to the streptococcus does not determine the question of virulence or avirulence of this organism. Other tests will have to be found to establish the virulence or avirulence of a given streptococcus. The routine bacteriological examination early postpartum is practical and important from the standpoint of prophylaxis, diagnosis, prognosis and treatment. The clinical symptoms alone are not sufficient to establish a diagnosis of puerperal septicemia. The bacteriological examination is necessary to definitely establish diagnosis. The finding of the streptococcus, hemolytic or nonhemolytic, in febrile or afebrile cases, would indicate prompt isolation of the case to prevent the spread of infection in maternity hospitals. We have to recognize "healthy carriers" and "unsuspected carriers" of puerperal infection. The finding of hemolytic or nonhemolytic streptococci in the secretion in febrile cases postpartum suggests the possibility of a grave infection. The finding of hemolytic streptococci in the blood is, according to most observers, synonymous with a fatal issue. Hemolytic or non-hemolytic streptococci causing morbidity are not necessarily of exogenous origin. Autoinfection plays an equal rôle with exogenous infection as to frequency of sepsis, but not as to its severity. Extra-genital infections with faulty personal hygiene on the part of the patient will increase the possibility of autoinfection during the puerperium.

In the same series of cases the same writers (*Ibid.*, 699) studied the opsonic index. This they found of value in determining the patient's resistance and the possible gravity of the infection when present. But it cannot be said to determine whether a given streptococcus is virulent or avirulent. It is therefore of value from a clinical standpoint only. The actual labor involved in the opsonic test, also the great possibility of error, even in the hands of the most experienced, would rule it out from being applied as a routine test in daily practice. It is of value in research work. Vaccine treatment, according to this research, is of value in puerperal sepsis and is worthy of further trial in similar cases.

**Gravidic Hypertension.**—V. Wallich (*Ann. de gyn. et d'obst.*, Nov., 1912) says that hypertension is a syndrome that should be carefully studied in pregnancy. It seems to be related to a functional disturbance of the kidneys and autointoxication. This hypertension is signalized by headache, insomnia, edema, and polyuria, and may be responsible for placental or visceral hemorrhage. The pulse tension of the pregnant woman should be carefully watched, with the sphygmometer. When recognized, hypertension should be treated by rest in bed, diet, laxatives, and medicines which reduce hypertension. In acute cases we should resort to venesection with abundant and repeated bleedings. We should be prepared to foresee and prevent eclampsia, and these attacks of hypertension, which may kill either mother or child. High arterial tension may be regarded as the usual cause of placental hemorrhages, and of the visceral hemorrhages which occur in eclampsia and albuminuria. Nitrogen ingestion must be regulated and meats reduced to once a day.

**Oxytocic Action of the Extract of the Posterior Lobe of the Hypophysis.**—A. Siguret (*Arch. mens. d'obst. et de gyn.*, Dec., 1912) says that for producing abortion the extract of the hypophysis has shown itself unreliable. To cause the expulsion of the placenta after abortion the effects have appeared variable. For inducing premature labor its effect has also been unreliable, the more so the longer before term it is used. In the clinic of bar the extract of the posterior lobe of the hypophysis alone was used. The author found that the contractions became more frequent after each injection, and in the cases in which a second injection was made sufficient contractions were brought about to cause spontaneous delivery. Dilatation has always progressed rapidly after the injection; engagement and rotation happening very soon after the extract was given. The acceleration of dilatation was greatest as dilatation was already nearing completion. In the first twenty-seven cases the observer noted the tension, pulse of the mother, and the heart beats of the child. In the fetus the heart beat was not modified and the same was the case with the pulse of the mother. Thus the energetic action of the extract on the uterine fibers is proven and its assistance in accomplishing the delivery. In a rachitic woman thirty-one years old a rupture of the uterus was observed by the author after its use. Lastly the extract was used in Cesarean section to cause retraction of the fibers of the uterus. It was found to cause hardening of the uterus; the amount of blood lost was small and the uterus retracted at once. The author concludes that the extract of the hypophysis is useful to bring about contraction of the uterus. Under its action the uterine contractions promptly become more frequent, strong, and effective.

**Rôle of Suprarenal Insufficiency in Incoercible Vomiting of Pregnancy.**—Emile Sergent and Camille Lian (*Presse méd.*, Dec. 11, 1912) report six cases in which the vomiting seemed to be part of a syndrome due to suprarenal insufficiency. The symptoms were asthenia, digestive troubles, abdominal pains, and circulatory disturbances. There were hypotension, tendency to syncope, and even sudden death in some cases. This syndrome regresses rapidly, almost immediately under the influence of adrenalin, or suprarenal extract, and that after the failure of other medication. The author considers that in some cases incoercible vomiting is not the result of autointoxication but of an insufficiency of the suprarenal function, and that opotherapy is the appropriate treatment. Experiments on guinea-pigs, with histological examination of the ovaries, have shown that the cortical layer of the suprarenal capsules is one of the lines of defense for the female organism in pregnancy, which neutralizes the autointoxication of the early months of pregnancy, or the villo-toxemia. In some cases the villo-toxemia is very severe and the suprarenal capsules after a period of overwork give out and fail in their function. If this condition can be diagnosticated a therapy that will bring about relief can be at once instituted and rapid relief obtained. Abortion should not be produced until such therapy has been carefully tried.

**Manual Compression of the Abdominal Aorta for Postpartum Hemorrhage.**—In dealing with desperate cases of postpartum hemorrhage. E. P. Davis (*Surg. Gyn. and Obst.*, 1913, xv., 662) has found direct compression of the abdominal aorta intrauterine pressure promptly efficient, and it has given opportunity to apply stimulating methods of treatment and permanently arrest bleeding. After securing sufficient dilatation the uterus is emptied of its contents. The hand with the closed fist is then carried within the uterus just above the pelvic brim at the bifurcation of the aorta, and the aorta is compressed by forcing the knuckles backward toward the spinal column. Subsequently the uterus may be packed.

**Treatment of Toxemia of Pregnancy.**—Believing that toxemia of pregnancy may be due to suboxidation. G. P. Shears (*Med. Rec.*, Jan. 11, 1913) suggests the free use of oxygen either by inhalation or subcutaneously. His own results have apparently been favorable.

**New Type of Ectopic Gestation.**—T. O. Doederlein and M. Herzog (*Surg., Gyn. and Obst.*, 1913, xvi, 14) describe a hitherto unknown type of ectopic gestation, one in an adenomyoma uteri. There was present an adenomyoma in the left tubal angle or below it. This tumor contained glandular spaces, which were probably derived, not from any embryonic inclusions originating from the Wolffian body, but from the uterine mucosa. The gland spaces may have been present in the tumor from the very beginning or they may have entered into its substance at a somewhat later period in consequence of inflammatory processes. Evidently there was a connection between the uterine mucosa and the gland spaces of the tumor. A fertilized ovum, by some unexplainable coincidence, got into the gland spaces of the tumor and there developed. A fairly typical, though quite irregular, decidua was formed, and the growing ovum stimulated the tumor to rapid growth and created for itself a cavity to accommodate the placenta. Pregnancy was interrupted, the embryo died and was expelled in fragments. The latter were forced through the glandular canal connecting the tumor cavity with the uterine cavity.

**Ovarian Tumors Complicating Pregnancy, Delivery, and the Puerperium.**—C. W. Barrett (*Surg., Gyn. and Obst.*, 1913, xvi, 28) says that pregnancy frequently takes place even though tumors of both ovaries are present. The growth of the ovum produces such changes in position and structure of ovarian tumors as to make it a menace to the child and mother during pregnancy; extra hazards occur during labor and are at their height for the mother during the puerperium. Induced abortion with its 100 per cent. of child mortality is unjustifiable, in that it offers no corresponding improvement in the condition of the mother. Early removal of the tumor as soon as possible after its discovery, gives a high percentage of good results in both mother and child and removes the hazard during labor and the puerperium. Abortion follows ovariectomy during pregnancy in proportion to the damage already done. Tapping or puncture of the tumor shows too large a mortality to make them justifiable procedures, except as preliminary expedients



in rare cases. The danger of abortion after double ovariectomies is not sufficiently great to call for other treatment than that accorded the single tumor. The results during the latter half of pregnancy are such as to warrant removal of the tumor rather than to let the patient continue to term, the increased percentage of abortion being due largely to increased damage previous to or during operation. A patient in labor with a complicating tumor should be placed in the most favorable surroundings possible, and labor allowed to terminate, if unobstructed. This should be facilitated by the use of forceps, if labor is at all difficult and the tumor located well above the pelvis; position and manual efforts may change a pelvic obstructing tumor into an abdominal nonobstructing one. Tumors interfering with labor pains, or located so as to obstruct the outlet or presenting torsion, hemorrhage, or suppuration, thus offering immediate abdominal complications, may be operated upon with Cesarean section accompanying, or, if the outlet is adequate, as shown by previous easy labors or by liberal measurements, and the soft parts are well dilated, labor may be allowed to continue, after the removal of the tumor. Vaginal Cesarean section may be performed in some cases with inertia. Vaginal puncture of an obstructing tumor may rarely be permissible, but should be followed by vaginal or abdominal removal before or after labor, as puncture alone gives a high mortality. On account of the risk of torsion and degenerations during the puerperium an ovarian tumor should be removed as soon after labor as the patient's condition and surroundings warrant.

W. C. Jones (*Surg., Gyn. and Obst.*, 1913, xvi, 63) records a case of sudden and profuse hemorrhage into an ovarian cyst immediately after delivery. He says that with these cysts torsion of the pedicle is the most common accident with its resultant hemorrhage, gangrene, and infection. The most frequent result of twisted pedicle is hemorrhage, which occurs in about 50 per cent. of all cases of torsion. Hemorrhage from all causes occurs in about 12 per cent. of all ovarian tumors, in both the pregnant and the nonpregnant, 9 per cent. in the former and about 3 per cent. in the latter. Though the multilocular cystadenoma is the most common cyst of the ovary yet dermoids seem to produce serious trouble proportionately more frequently. The tendency of ovarian tumors is almost always to increase in size more or less and also sooner or later to undergo torsion, hemorrhage, gangrene, infection or malignant degeneration. Hence in general, these cysts should be removed as soon as possible after they are discovered. One should usually be particularly careful not to let a woman pass into the puerperium without first ridding her of the cyst. An ovarian tumor in most cases should be removed as soon as it is found. In case the tumor is not discovered till after the fifth or the sixth month of pregnancy, one frequently is justified in waiting till the child is viable. Aspiration has a very high mortality. Obstetrical operations have an enormous mortality, unless the obstructing tumor is removed before they are undertaken. Ovariectomy (usually abdominal) has a mortality



far less than any other procedure (less than 5 per cent. of all cases). Cesarean section, if undertaken early, is an excellent procedure in certain cases.

**Protein Metabolism of Normal Pregnancy.**—In three cases of normal pregnancy followed by normal puerperium, the distribution of the nitrogen and sulphur fractions of the urine was found by J. R. Murlin (*Surg., Gyn. and Obst.*, 1913, xvi, 43) to be very nearly the same in the antepartum and postpartum periods. The total nitrogen in the urine shows a sudden increase, independently of the nitrogen in the food, at about the sixth or seventh day postpartum. The nitrogenous autolytic products from the uterus are for the most part converted to urea before excretion. The ammonia nitrogen is slightly higher in the antepartum period than in the postpartum period. The urea-pus-ammonia nitrogen in the antepartum period is lowest in percentage of the total nitrogen, when the retention of nitrogen is probably greatest. This confirms the idea that the nitrogen held back for growth of the product of conception is potentially urea or ammonia nitrogen. The "formol-titrating" fraction is the same after delivery as before. The creatinin nitrogen is higher, both relatively and absolutely, before delivery than after; the creatin nitrogen higher in both senses after delivery than before. There is no indication in the urine of hepatic inefficiency in late pregnancy. Creatin in the urine before delivery may indicate a lack of carbohydrate in the food; after delivery it is always present during the involution period. The N:S ratio in the urine of these patients was slightly higher than is usually found on an adequate diet. Because less food was ingested immediately after delivery than before, the ratio was higher in the postpartum period. The inorganic-sulphate sulphur was lowest in percentage of the total sulphur where the retention of nitrogen was (probably) greatest, and highest where the retention was least. The neutral sulphur was least in percentage where the retention was least, but, owing to indicanuria, was not greatest where the retention was greatest. A high percentage of neutral or unoxidized sulphur does not indicate diminished oxidation in the pregnant subject. The distribution of the sulphur fractions indicates that the sulphur which is excreted as inorganic sulphate is the sulphur held back for fetal development.

**Pathological Conditions which Justify Abortion.**—Among these O. P. Humpstone (*L. I. Med. Jour.*, 1913, vii, 17) includes serious manifestations of the toxemia of pregnancy; continued high blood pressure, over 150, associated with dyspnea and renal insufficiency and not responding in a few days to treatment; also muscular weakness increasing with the associated pains of a developing multiple neuritis, especially if any psychosis is present. Chorea gravidarum is an absolute indication. Abortion is also demanded by an incarcerated retrodisplaced pregnant uterus, caught beneath the sacrum, which cannot be reduced under anesthesia, an acute hydramnios in the early months of pregnancy, with its associated cardiac insufficiency. Two valvular lesions absolutely indicate abortion: aortic stenosis, and mitral stenosis with or without

insufficiency. In cases of mitral insufficiency, should a break in compensation occur which is not easily controlled by proper medication and rest, the immediate termination of the pregnancy is indicated. In chronic diffuse nephritis, with exudation of finely and coarsely granular casts, where chronic uremic symptoms have persisted, it is out of the question to expect such damaged kidneys to be sufficient for pregnancy. The same holds true for the chronic diffuse nephritis without exudation, with its associated arterial thickening, blood pressure and weakened heart muscle. In any case in which active pulmonary tuberculosis is manifest early in pregnancy abortion should be performed. With a pelvis so contracted as to be an indication for delivery by the abdominal route, the patient has the right to choose between abortion and Cesarean section at term.

**The Postpartum Closure of the Uterine Vessels.**—Hecknes (*Zeitsch. f. Geburt.*, vol. lxxii, 2) discusses the histological basis of the closure of the vessels in the uterus after labor. He examined twenty-five uteri, of which fifteen were observed during various stages of pregnancy and the others during the puerperium. Briefly stated, his conclusions are as follows: as regards the microscopic examinations of these specimens, namely, that during pregnancy and in the puerperium, a swelling of the endothelial lining of the vessels occurs, and that at the end of pregnancy connective-tissue bundles appear which are also to be observed during the puerperium. These processes favor closure of the vessels but do not result in the formation of thrombi and their organization.

#### GYNECOLOGY AND ABDOMINAL SURGERY.

**The Prophylaxis of Postoperative Peritonitis.**—Herff (*Gyn. Rundsch.*, Bd. vii, No. 1, 1913) believes that the introduction of a solution of hydrogen peroxide is an effective prophylactic measure in laparotomies which have been previously infected, especially in abdominal hysterectomy for carcinoma. He advises the direct application of a one-half strength solution to the wounds in the peritoneum, and also to the muscles and fascia in the region of the incision. He has thus far treated twelve cases with good results as regards pulse and temperature. In one instance where a patient died as a result of embolism the autopsy showed the entire absence of intestinal adhesions.

**The Differential Diagnosis between Ascites and Ovarian Cysts.**—Dienst (*Münch. med. Wochenschr.*, 1912, No. 50) refers to cases in which a diagnosis between these two conditions is impossible and where the patient refuses an exploratory laparotomy. Very often it is essential to relieve these patients by abdominal puncture. In some cases of ovarian cyst the secretion resembles ascitic fluid, and there are also cases of ascites with admixtures of chyle in which a diagnosis of a pseudomucous cyst is probable. In such doubtful cases Dienst purposes the following differential test. As fibrinogen is always present in ascitic fluid, and is precipitated by a concentrated solution of sodium chloride, and as this does not occur in fluid from a cyst, it is merely necessary to test the same in this

manner. If a third of the volume of salt is added to the fluid in a test-tube a flocculent precipitate occurs.

**Utero-pelvic Phlebitis and its Surgical Treatment.**—J. Vanverts and H. Paucot (*Rev. mens. de gyn., d'obst. et de ped.*, Nov., 1912) say that septic materials may be spread throughout the system in two ways, by the blood current and by the lymphatics, or both of these may act together. Venous infection brings about phlebitis and uterine and periuterine thromboses. These may extend by way of the pampiniform plexus and ovarian vein, or through the uterine vein and the hypogastric. In the march of thrombosis the process may not be limited to the small pelvis, but may reach the primary iliac vein and inferior vena cava, or even go further and pyemia result. The author considers whether operation is justified in such cases. In cases in which the phlebitis is the cause or the most marked manifestation of infection, as it is found to be in one-third of the autopsies, surgical interference would seem justified. The location and extent of the thrombus are very variable. It may be located at a distance from the uterus. If there is only a localized focus of infection we may hope to remove it by operation. In very virulent infections the walls of the veins are unable to resist the infection and ulceration takes place, and the infection passes out of the vessels. In these cases even very early venous ligation would be too late to do any good. Another necessary condition for successful operation is that the thrombus should not reach too high up. To ligate a vein containing clots and pus would be both useless and dangerous. The author concludes that theoretically ligation is justifiable in thrombophlebitis that does not show extravascular lesions, that is, in subacute or chronic pyemia of slight virulence, and in those cases in which the localization of the process within the pelvis allows of intervention beyond the area of thrombosis, in the healthy portions of the veins. The results of operation have been tabulated in eighty-two cases, in which there were forty-nine deaths and thirty-three recoveries. In the recovered cases the process was chronic and of slight virulence, the operation being done late, as late as the twentieth day after the abortion or confinement. In the fatal cases there were extravascular abscesses, lymphangitis, or extension to the large venous trunks. Operation is of value in only a certain number of cases. Contraindications to operation are undoubted signs of periphlebitis; and the presence of multiple and early metastases. When in the course of a thrombophlebitis, after a remission chills begin again, surgical intervention is allowable. Operation must bar the way to embolisms and prevent the carriage of infectious products into the venous system; it must also embrace the entire original phlebitic area.

**Sterility in the Female without Marked Gross Lesions.**—C. C. Norris (*Surg., Gyn. and Obst.*, 1912, xv, 706) says that one in every seven or eight marriages is sterile. About 50 to 75 per cent. of these are due to sterility of the woman. Sterility may be the result of a variety of causes, both local and general. Excluding gonorrhea, the three most frequent local causes productive of sterility are hypoplasia of the uterus, constriction of the cervical canal or a mild

grade of cervicitis. The routine practice of subjecting all cases of sterility to some form of dilatation operation, often without even ascertaining if the woman be the partner in fault, cannot be too severely condemned. When hypoplasia of the uterus, a constriction of the cervical canal, or antelexion is present, the stem pessary offers an excellent means of treatment. It produces permanent dilatation, as proven by the fact that it cures more than 86 per cent. of cases of expulsive dysmenorrhea. The stem pessary tends to produce development in those cases of hypoplasia of the uterus and by the drainage secured, often cures, and in all cases facilitates the treatment of endocervicitis of nongonorrheal origin. It also straightens out flexions. In the gynecological department of the Hospital of the University of Pennsylvania, this form of treatment has been successful in 37 per cent. of cases of sterility. No ill effects have followed this form of treatment in any of the cases operated upon for either sterility or dysmenorrhea. It is essential that gonorrhea and the various forms of pelvic inflammatory disease be excluded.

**Secretory Activity of the Mammary Glands Independently of Pregnancy.**—According to James Oliver (*Edinb. Med. Jour.*, 1912, n. s., ix, 530) it not infrequently happens that milky fluid is obtainable from the human female breast independently of the influence of pregnancy, but apparently only in women living a marital life, whether they have already borne children or have never been pregnant. It may be noted within two or three months after marriage and after prolonged periods of sterility, and may persist for years in spite of the continuance of a state of sterility. It may or may not be noted in conjunction with some trifling derangement or some gross lesion of the organs of generation such as cystic degeneration of one or both ovaries, one or more fibroid neoplasms in the uterus, descent of both ovaries, or more or less leukorrheal discharge and no other apparent derangement. In the majority of cases the fluid is only obtainable by firm but gentle pressure upon the breasts. The presence of milky fluid in the breasts is consequently not an infallible sign of pregnancy.

**An Overlooked Function of Bartholin's and Cowper's Glands.**—D. T. Smith (*Jour. A.M.A.*, 1912, lix, 2303) states that as soon as the act of urination has ceased a contraction of the walls of these glands takes place, extruding mucus into the passages to take the place of that which has been washed away by the passing urine, thus protecting the denuded mucous membrane. The contraction of the gland walls is reenforced by that of the walls of the urethra in the male, and in the female, by the contraction of the muscles about the outlet of the vagina. It is probable, too, that in all cases a reflex stimulus is conveyed to the glands which causes an increase in the quantity of their secretion.

**Tubal Sterilization.**—To meet the objections to other operations for this purpose F. J. Taussig (*Surg., Gyn. and Obst.*, 1913, xvi, 92) combines the best features of several. His method includes resection of the narrowest part of the tube (the interstitial portion); closure of the uterine wound by a double layer; first of the uterine

wall, second of the round ligament; burying of the proximal end of the cut tube far away from the uterine horn, between the layers of the broad ligament; and prevention of hydrosalpinx by leaving the fimbriated end of the remaining portion of the tube open.

**Treatment of Pelvic Inflammation by Autoinoculation.**—It is, says H. Chapple (*Lancet*, Jan. 18, 1913), now generally accepted that an increased blood supply to an infected area causes the liberation of an increased quantity of toxins into the general circulation, thus producing an autoinoculation with the products of the actual offending organisms. So by raising the local temperature of the pelvis sufficiently for a definite length of time an increased blood supply to the pelvic organs is induced, and an autoinoculation capable of sufficiently accurate control is effected. The difficulty of isolating the offending organisms is thus overcome. The best results will be obtained by regulating the dose both as regards quantity and time of introduction, the aim being to give the second dose when the negative phase produced by the first is over and the positive phase has been definitely entered upon. By this means we can raise the patient's index to the offending organisms and markedly increase her ability to deal with them and their products. Should we be dealing with a case in which the trouble is dependent on an inflammatory mass due to an organism now dead, the pelvic congestion is still of great value, in that the increased vascularity assists in the absorption of the inflammatory products. The desired pelvic congestion is easily produced by the heat emanated from several powerful electric lamps, which are suspended from a suitable cradle, which surrounds the patient's pelvis. By introducing into the vagina a suitable Fergusson's speculum with its upper end in the posterior fornix and consequently lying almost in contact with the inflammatory area, and its lower end in direct communication with the bath, it is possible to raise the vaginal temperature very considerably and also the actual temperature of the pelvic structures in the neighborhood of the pouch of Douglas.

**Complement Fixation Test in the Diagnosis of Gonococcus Infection of the Genitourinary Tract.**—Continuing their investigations in this line. H. J. Schwartz and A. McNeil (*Amer. Jour. Med. Sci.*, 1912, cxliv, 815) state that a positive reaction denotes the presence or recent activity in the body of a focus of living gonococci. A negative reaction does not exclude gonococcus infection but is of considerable importance. A strong positive reaction is not to be expected earlier than about the fourth week, and then only in very acute cases with some complication. A positive reaction is not obtained if the disease is limited to the anterior urethra. A positive reaction does not disappear entirely until seven or eight weeks after cure, therefore if a strong positive reaction is obtained as long as this after apparent clinical cure, the patient should be looked upon as still harboring gonococci. In chronic cases, isolation of the gonococcus in culture is the only absolute, bacteriological proof of gonococcus infection. In cases regarded as postgonorrheal, a positive reaction is obtained in 31.4 per cent. In 165 cases



looked upon as clinically cured for at least three months, a positive reaction was obtained in 13.2 per cent. In women a positive reaction is probably not obtained unless there is at least some involvement of the cervix. On account of the unreliability of the bacteriological diagnosis of gonococcus infection in women, the complement fixation test should prove of special usefulness in gynecological conditions.

**The Influence of the Ovary on Sugar Metabolism.**—Stolper (*Gynäk. Rundschau*, vol. vii, No. 3) presents confirmatory experiments made in the human subject which he has already carried out in animals. He previously showed that in castrated animals the power of assimilation of sugar was reduced. His observations include women in whom the ovaries were removed by operative means or in whom they did not functionate for physiological or pathological reasons. Thirty-eight cases were thus observed, in sixteen of which the uterus and ovaries were removed. In the remainder the ovaries alone were either removed or they did not functionate for various reasons. In all cases the urine was examined before and after the ingestion of 100 grams of grape sugar. It was found that the power of assimilation in women in whom the ovaries had been removed was markedly reduced and that similar results were observed during the menopause and afterward. The author believes that the processes are very complex, and that the result is partially due to the effect on the pancreas and the adrenal system because these glands with internal secretion are probably closely connected with the ovarian physiology. The practical value of this observation is believed by the author to be an important means of determining functioning power of the ovaries. Thus the reduction of the ability to assimilate sugar where diabetes can be absolutely excluded is due to a diminished functioning ability, whereas an increase of this ability is probably due to increased ovarian function.

**The Relation of Chronic Appendicitis to the Female Pelvic Organs.**—Mueller (*Münch. med. Wochenschr.*, Dec. 24, 1912) presents his observations in a series of 300 cases operated upon by him in which there were only nineteen acute inflammations. Among the 281 chronic cases were seventeen in which extensive adhesions of the pelvic organs were present in which the appendix was likewise involved. In 191 cases out of the remainder, cystic degeneration of the ovaries on both sides, and in forty salpingitis likewise was noted. In a large number of the cases a history of intestinal disturbances combined with dysmenorrhea were noted, although marked attacks of appendicitis were denied or did not appear until later in life. As the symptoms of endometritis, salpingitis, ovaritis, etc., usually disappear after the appendix was removed. Mueller considers that this work must be regarded as the most important etiological factor in their production. The author believes that in women appendicitis is usually chronic in character, and rarely heals spontaneously. Local tenderness is frequently absent due probably to the generalized adhesions present, as further observations have



further convinced him that in the majority of cases chronic pelvic disease has an intestinal origin, and that gonorrhea occupies a less important factor in the etiology. The method of infection is due, Mueller believes, through the lymphatic and the retroperitoneal tissues and also through the appendiculoovarian ligament. Other ways are by direct contact of the inflamed appendix with the pelvic organs and by the free discharge of an exudate from the involved appendix in the pelvis. The chronic character of these conditions lead to an involvement of the nervous system, and operation is therefore indicated as soon as the diagnosis can be confirmed. He believes, moreover, that the cystic oophoritis as well as the frequent involvement of the tubes are the most frequent causes of sterility, and that these depend directly upon appendicial disease.

**The Pancreas and Ovary in Their Relation to Sugar Metabolism.**—Stolper (*Gyn. Rundsch.*, vol. vi, No. 24) has already shown in a previous communication that the ovary exercises an influence on sugar metabolism and demonstrated that in castrated animals the limits of assimilation for sugar were reduced, whereas in those subjected to an excess of ovarian substance, this was increased. It was also shown that the ovary exercises an inhibitory action on the adrenal system in animals which had been castrated, in so far that the adrenalin glycosuria was increased but diminished in others. It seemed necessary therefore to study the relation between the ovary and the pancreas, as the integrity of the latter seemed necessary for the proper metabolism of sugar. A number of dogs were studied in which a partial exsection of the pancreas had been made. It was found that the reduction of the ability to assimilate sugar could be compensated for by the administration of ovarian substance to a certain degree. On the other hand after these animals were castrated the assimilating boundaries for sugar were even more greatly diminished.

**The Treatment of Amenorrhea.**—Hofstater (*Zentralbl. f. Gynäk.*, 1912, No. 46) presents a preliminary communication on the results of treatment in thirty-three cases with hypophyseal extract. The patients included cases of amenorrhea dependent on a primary hypoplasia of the uterus or the ovaries, on general infantilism, on atrophy of the uterus following lactation, on anemia, cachexia, and on mild adnexal disease. In about two-thirds of the cases bleeding from the genitals took place after several injections which both subjectively and objectively presented every evidence of menstruation. In about one-third of the cases continued injections or the administration of tablets were sufficient to keep up the periods. Even in cases where the bleeding did not take place a general improvement of the patient occurred, which was also noted in cases following castration and the menopause. In very fat women it is also advisable to combine this treatment with thyroid administration. These apparently favorable clinical results cannot as yet be explained until the effect of extracts of the anterior and posterior lobes as well as the intermediary portion of the gland can be differentiated physiologically.

# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### INFLUENZAL MENINGITIS.\*

BY

THOMAS S. D. GRASTY, M. D.,

Washington, D. C.,

IN first establishing a definite diagnosis of influenzal meningitis by demonstrating the existence in the cerebrospinal fluid of the Pfeiffer organism and in proving the causal relation of this organism to the disease in question, a great service was rendered to humanity by the zeal and energy of Slawyk.

Since this discovery of the influenzal bacillus in the spinal fluid of the living body, the attention of the profession has been steadily drawn toward a consideration of the meningeal presentments in certain cases of influenzal infection. Pfuhl, in 1892, reported three cases of meningitis in which he ascribed the disease to the activity of the Pfeiffer organism. Not that the organism appeared alone in the culture, for mixed infection was evident. Consequently the ascription of the meningeal inflammation to the agency of any particular bacterium was but the recording of an individual opinion, and not a fact of scientific record. The literature of medicine then contained but little on the subject of the involvement of the meninges of the brain and cord by the influenzal bacillus; so that Pfuhl's paper, which in a short space of time was followed by a report of eleven more cases, was a welcome addition to our knowledge. In this particular field of endeavor appear the names of Testivin, Fraenkel, Memner, Dubois, Thomesco, Adams and Mya. In the year 1903 Mya reported to the profession three cases of influenzal meningitis, all in infants. Mya expressed at this time his decided opinion that the influenzal bacillus, as regards the production of meningitis, was of equal pathogenetic rank with the meningococcus and the pneumococcus. That this bacillus was capable of producing

\* Read before the Washington Obstetrical and Gynecological Society, November 8, 1912.

a rapidly fatal form of meningeal disease was, to his mind, a fact beyond dispute.

In regard to the manner of production of the distinctly local lesion, the meningeal condition may be the direct resultant of a general systemic involvement. It is also an incontrovertible fact that the local lesion of a meningitic character may be the sequel of a joint affection, the materies morbi spreading from the point in question to the meningitic area. With the lung as a primary focus, with a *nasal catarrh* of an influenzal nature as a starting-point, with otitis media a source of infection, influenzal meningitis may result. The presence of the influenza bacillus in pure culture can alone give anything approaching a scientific value to the diagnosis in a given case. Statistical students must positively exclude all other cases, if the history of influenzal meningitis is to be written correctly. This point has been well taken by Cohoe, of Baltimore. It is true that the relation of the bacillus to the disease has not been proved according to the postulates of Koch's law, still the presence of the bacillus in pure culture is of sufficient import to give the case at issue a full and impartial hearing before a medical tribunal.

In the great majority of the recorded cases the patient was an infant, about 60 per cent. of sufferers being under one year of age. Cohoe's case is of interest in this respect owing to the fact that the patient was an adult, and, furthermore, that the case ended in recovery. As regards sex, the records show that males are more frequently affected than females. In regard to the duration of the disease, the records show that the average duration of the malady is from five to twenty-six days. One case on record died in the seventh week.

Postmortems have been obtained in the majority of fatal instances, giving complete and reliable data on the pathology of the subject. Generally speaking, the visible lesions differ in no way from the lesions found in cases of pneumococcus or meningococcus infection. The thickened dura, the tissue infiltration, the presence of pus, the distended ventricles, the flattened sulci, are all present. The exudate may be thin, of a serous character, and of a light yellow or greenish color. The cerebrospinal fluid is, in most cases, exceedingly turbid, but it may be clear and transparent. The tension is of course increased. Variability in the site of the lesion has frequently been noted as a characteristic feature in the brain pathology of the influenzal cases, giving a degree of plausibility to the theory of a local point of entry. For it is a fact that in this malady, the lesions are often found at such a point as to suggest at once the possibility

of nasal or aural infection. Diffuse lesions are to be regarded as the result of a general, systemic infection—probably of a gastrointestinal derivation. While the brain does show this degree of variability in the site, extent and character of the lesions, the cord shows a more uniform involvement both as regards degree and extent. The deposition, generally uniform, extends along the vessels, and the diffuse character of the involvement is found likewise in the spinal membranes.

The locations of the influenzal bacilli have, by the various authors, been variously described. Fraenkel is said to have found them in the exudate only. Pfuhl, on the other hand, found them in the lymph-channels, in the blood, in the neuroglia and in the cellular tissues. To complete the matter of bacillary residence, Slawyk found the influenzal bacteria in almost every part of the body.

According to the opinion of the best observers, the central nervous system is the point of least resistance for the invading influenzal organisms, owing to the fact that the spinal fluid is the most favorable medium for the growth of the influenza bacillus. As a general rule, the results of animal experimentation have been anything but satisfactory. Pfeiffer, in particular, was utterly unable to obtain anything approaching tangible results. According to the work of Catani, direct brain injections offer the only chance of obtaining results. As is the case with many other organisms, mixed infection greatly increases the activity of the influenza germ. The activity of the toxins of this bacterium is a matter worthy of particular consideration. At the hands of Cohoe, of the Johns Hopkins Hospital, a valuable piece of scientific data is on record. The experiments of Catani, according to Cohoe, proved that the toxins of the influenzal bacillus are, relatively compared, of a remarkably intense degree of virulence. The observations of Catani are confirmed by other scientists.

The literature shows practically no difference, as regards the symptoms, in the manifestations based on varied bacteriological forms. The influenzal form adds little to the general clinical picture found in the ordinary case of meningitis. The general symptoms of meningeal infection as found in the books hold good. There is, however, one feature of influenzal infection worthy of special consideration. In other forms of meningeal infection, the leukocyte count is high, but in the disease under consideration, the opposite is found. With a count of from 25,000 to 40,000 in the meningococcic form, the leukocyte count in the influenzal form rarely exceeds 15,000.

Beyond this point, the blood picture has not been extensively elaborated.

As regards the diagnosis of influenzal meningitis, certain points are to be carried in the mind. In most of the cases, Kernigs sign, likewise the Babinsky sign, is present. The stage of irritation, the stage of excitement and the stage of depression and coma as found in the ordinary case of meningitis, are present. The positive diagnosis is only to be made by means of a lumbar puncture and the subsequent recovery in pure culture of the influenza bacillus. The presence, in the patient's locality, of an epidemic of influenza is, of course, a factor in the diagnosis of a case of influenzal meningitis. The presence in the body of a patient of a suppurative focus is also to be carefully regarded.

Of the possible complications, the following are to be noted: encephalitis, optic neuritis, epidural abscess, myelitis, poliomyelitis and hemiplegia.

In all cases of influenzal meningitis, the prognosis is exceedingly grave, the mortality being about 85 per cent. When we consider the parts attacked, the age, and, as a rule, the debilitated state of the patient, the high death rate need occasion no wonder. Then again, the therapy of the disease is anything but satisfactory to the practitioner. The rôle played by lumbar puncture is hardly calculated to excite, in the mind of the physician, an ardent desire for its performance except as a diagnostic measure. It is the consensus of opinion among medical men that the treatment of influenzal meningitis is purely symptomatic. Except possibly by the use of a stock vaccine or an autogenous vaccine prepared from the organisms from the spinal fluid.

#### STATEMENT FROM DR. WILSON B. MATTHEWS.

CASE.—W. B. M. was born on November 17, 1908. At birth he weighed 10 pounds, was well nourished and physically perfect. He developed into a strong, healthy child. About November 1, 1910, he caught cold and for a time seemed "croupy," but except for some slight symptoms continuing, such as some running of the nose, he appeared to get quite well over this. On November 27, 1910, a stranger seeing him in the street, stopped to remark what a perfect specimen of health he appeared to be. On Tuesday morning, the twenty-ninth, his mother noticed a peculiar and unusual condition of one of his eyelids, which seemed to droop, but he did not complain or fret. She has since then said she believed the vision of that eye was in some way affected, but we cannot be certain of that. However, after he became very ill, and as long as he was

conscious, this eye seemed to be in some way affected, and the drooping of the lid was later more pronounced. At that time in the morning there appeared to be nothing whatever troubling him. As late as the afternoon he was unusually bright and amusing, imitating some large children whom he was accustomed to see make their preparations for going to school. This was as late as 3 o'clock. Soon after, and quite suddenly, he began to complain. He tried, as was his custom, to go up the stairs himself when his bedtime came, but the effort was too great for him and he wished to be carried. He was disinclined to play and seemed glad to get into bed. He went more quietly to sleep than usual after taking only a small part of his bottle. About 10 o'clock he suddenly sat up in bed and vomited. That night he had convulsions which seemed to be of a mild type. He would raise himself upon his hands and tremors would run through his frame from head to foot. They resembled violent chills. His fever increased throughout the night. From then on he grew steadily worse. On Thursday afternoon it was apparent that there were symptoms of meningitis. The head was retracted. Later on he would lie in only one position—on the right side. No matter how placed he would get quickly back to the right side, seeming to suffer less in that position. By Thursday evening he seemed not to be conscious of anything. On Friday evening December 2, 1910, he was taken to the hospital with all signs of an acute cerebrospinal meningitis, and lumbar puncture was done by Drs. Prentiss and Syme; about 50 c.c. of purulent fluid was removed, and the equivalent of Weichselbaum's antitoxin inserted. Symptoms of increased pressure appeared during the injection. The patient never reacted and died during the early morning hours.

The report of the bacteriological examination of the spinal fluid is as follows:

About 20 c.c. of fluid was submitted withdrawn from spinal canal by lumbar puncture the night of Nov. 30, 1910, by Dr. Grasty; fluid remaining overnight in incubator.

Fluid slightly turbid, opalescent color. Cover-slip preparations showed polynuclear leukocytes chiefly, with a moderate number of large and small mononuclear cells.

The only bacteria observed are some small bacilli of variable morphology—some curved, others short, and some diplococcal. They are extracellular. Gram-negative.

Cultures were made on plain media, body-serum agar and human-blood agar and incubated at 38° C. for twenty-four hours. Only the blood agar tubes gave a growth and this consisted of minute pin-point dewdrop colonies. Subcultures on plain and blood agar gave growth only on the latter and it died out after several transplants on this media.

Stains of preparations from the blood-agar cultures showed a gram-negative bacillus with the identical morphology of *B. influenzae*, agreeing with the organism observed in the three other cases seen by me.

(*Signee.*) W. W. WILKINSON.



## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON PEDIATRICS.

*Meeting of March 13, 1913.*

HENRY DWIGHT CHAPIN, M. D., *in the Chair.*

#### CASE OF MONGOLIAN IDIOCY WITH A CONGENITAL HEART LESION.

DR. F. L. WACHENHEIM presented a female infant, aged six months, showing a combination of Mongolian idiocy and a congenital heart lesion. The latter was one of the numerous group consisting in a perforation of the intraventricular septum and open ductus arteriosus, forming a collateral circuit in place of the stenosed pulmonary orifice. In this case there was slight cyanosis when the child cried, showing that the collateral circulation was not quite adequate. So far as his experience went, the combination of these two lesions was unique though the presence of these two developmental defects in one subject should not strike one as very remarkable. The mother stated that another child presented a similar cerebral defect.

#### CASE OF CONGENITAL MENINGOENCEPHALITIS.

DR. WACHENHEIM presented a female infant, aged four months. The present condition had existed since birth, and the child apparently had not gained in weight. The patient presented periodic convulsions of the extremities, of athetoid type, associated with an extreme opisthotonos. The examination showed no rigidity or spastic condition of the extremities, but marked rigidity of the neck. The head was not enlarged and the fontanelles did not bulge. The pupils were markedly contracted but reacted to light. In view of the symptoms and their localization, the presence of a chronic meningitis of the base, and an encephalitis in the basilar region, probably the optic thalami, must be assumed. The noteworthy features of the case were the predominance of athetosis and the absence of spasticity in the extremities.

#### THE RESULT OF RECENT RESEARCHES INTO THE ETIOLOGY OF MEASLES.

DR. JEROME S. LEOPOLD said that for many years it was generally believed that the virus of measles was present in the blood and in the discharges of the nose and mouth of infected individuals. How-

ever, the definite proof of this hypothesis was only recently evolved. The first attempt to inoculate measles was made by Home in 1758 but his results and those of contemporaneous observers were not conclusive. In 1852 Mayr reported that he had infected children with measles by inoculating them with the blood and with the secretions from the nose and mouth of cases of measles. He also showed that the "scales" from a desquamating patient were not infective. In 1898 Chavigny reported a case of measles in a monkey which had been in close contact with a keeper who had the disease. On the basis of this observation Josias in 1898 placed monkeys in a measles ward for several months; it was doubtful, however, if his attempts at transmission of the disease were successful. Grunbaum, in 1904, attempted to inoculate the monkey with measles, but the results were negative. Hektoen in 1905 successfully reproduced the disease in two adults by inoculating them subcutaneously with blood taken from cases of measles during the first thirty hours of the eruption. This experiment demonstrated that the virus of measles was present in the blood, at least during the early stages of the disease. In 1910 Anderson and Goldberger inoculated two Rhesus monkeys with blood from a patient with measles. After eleven days both animals had fever but no eruption. The same experiment was again tried with the same result. The blood from a third patient was then inoculated into three monkeys; after ten days a rise in temperature in one of the animals was noted and a few papules were observed on the face. The eruption disappeared at the end of four days, and was followed by a fine scaling. The authors considered this a slight attack of measles. In these first experiments of Anderson and Goldberger the blood used for inoculation was taken from measles patients at least twenty-four to forty-eight hours after the eruption had been noted. The next series of experiments were conducted with blood taken less than fourteen hours after the eruption had appeared. Two Rhesus monkeys were inoculated. After an interval of ten days a rise in temperature with a typical eruption was noticed. Blood taken from the hearts of these monkeys and injected into other monkeys caused a rise in temperature and a typical eruption in several instances. Anderson and Goldberger attributed the failures in their first experiments to the fact that blood was not taken from the measles cases early enough in the course of the disease. These experiments demonstrated that blood taken from infected individuals some time before the eruption appeared induced a definite rise in temperature when injected into monkeys. Blood withdrawn eighteen hours after the first appearance of the eruption gave a well-marked elevation of temperature with a typical measles eruption, accompanied by coryza, pharyngitis, and bronchitis. No definite reaction could be obtained from blood taken sixty-five hours after the first appearance of the eruption, and no reaction at all was obtained from blood taken 113 hours after the first appearance of the eruption. In other words, it was shown that the infectivity of the blood was greatest shortly before the

eruption of measles appeared, lasted about twenty-four hours, and then rapidly diminished. Hektoen obtained positive results in man thirty hours after the eruption had appeared; this might be due to the fact that man was more susceptible to the transmission of measles than the monkey. The positive inoculation experiments of Anderson and Goldberger were confirmed by Nicolle and Conseil, Hektoen and Eggers, and Lucas and Prizer. Anderson and Goldberger were the first to observe typical Koplik spots in experimental measles in monkeys. In another series of experiments Anderson and Goldberger collected the discharges from the mouth and nose of measles cases twenty-four hours after the first appearance of the eruption. These secretions were applied to the mouth and pharynx of monkeys. Some of the secretion was also injected into the monkeys. Positive results were obtained in both instances. Attempts to inoculate monkeys with the epidermal scales of measles were negative.

A very interesting observation which, if confirmed, might be of some importance in establishing the etiology of measles was made by Aronson and Sommerfeld who found that the toxicity of the urine was much increased in measles. If 2 c.c. of urine from a case of measles were injected intravenously into a guinea-pig, the pig died immediately with the symptoms of anaphylactic shock, or else became extremely ill. The urine of patients ill with the "serum disease," or with the so-called "fourth disease" showed the same toxicity. On the other hand, urine from cases ill with scarlet fever, tuberculosis, pertussis, and typhoid, and healthy children, showed no such toxicity.

In conclusion it might be stated:

- (1) That measles can be experimentally reproduced in monkeys.
- (2) That the virus of measles is present in the blood and in the buccal and nasal secretions of infected individuals.
- (3) That the virus has not been demonstrated in the "scales."

#### THE TREATMENT OF SCARLET FEVER WITH INTRAVENOUS INJECTIONS OF NEO-SALVARSAN.

DR. LOUIS FISCHER and DR. MATHIAS NICOLL presented this communication. They stated that their investigation had been suggested because of the presence of a positive Wassermann reaction in some cases of scarlet fever and it seemed that possibly neo-salvarsan might offer specific therapeutic results in this disease as well as in syphilis and allied affections of the spirillum group. Lenzman, Schreiber, Klemperer, and Wiota had described advantages in scarlet fever from the use of salvarsan in that it exerted an antipyretic effect soon after injection, and there was a decided exfoliation of the necrotic membranes together with a tendency toward convalescence and an absence of fatal complications.

The studies had been confined to the mild and some severe types of scarlet fever cases. To test the efficacy of arsenic alone Fowler's solution was given in scarlet fever without result. It was found

that the arseno-benzol was the active agent. Neo-salvarsan was readily soluble in water; the simplicity of its preparation was in decided contrast to that of salvarsan. For intravenous injection 20 c.c. of freshly distilled water were used to every 0.1 gram of neo-salvarsan, or 0.9 of a gram was dissolved in 180 c.c. of distilled water. As to the relative strength of salvarsan and neo-salvarsan, 0.6 of salvarsan was equivalent to 0.9 of neo-salvarsan. Schreiber reported a series of results with infants to whom he gave 0.15; in nurslings he advised 0.05 of a gram. Luksch found that when an intravenous injection of salvarsan was given to animals infected with the streptococcus or the staphylococcus pyogenes infection, it seemed that it either arrested the infection or greatly retarded its progress. Clinical observations had to some extent verified these experiments, and still positive deductions could not be made until a large number of cases had been studied. In a case of osteomyelitis of the femur with a purulent phlegmonous process in which the preparation was employed as a last resort, marked improvement was noted. In three other cases of suppurative phlegmonous processes the fever subsided and the functions of the affected joints were restored in a very satisfactory manner. It looked therefore as though salvarsan might in the future be employed with success against infections other than those produced by the spirillum group. Nicoll had reported a case of noma in which salvarsan injection was given and the patient recovered. In the five cases which they now reported were all septic and were chosen because the prognosis was fatal. In all five cases a Wassermann examination was made; three of these proved negative, one probably positive, and one was unreported. All the injections were given intravenously. In young infants the size of the basilic vein was so small that it was necessary to cut down and expose the vein at the elbow in order to introduce the remedy. The jugular vein used in the fourth case offered the best means of introducing the injection. The dose employed was 0.2 gram dissolved in 40 c.c. of plain sterile water. The five cases were all in a desperate condition when the injection was given, two of them being complicated by extensive noma and three died subsequently. Though in two instances there seemed to be some improvement after the injection as indicated by a fall in the temperature. Two of the patients were still living; the prognosis for one being good and for the other very grave.

It would be unfair to draw conclusions from so few cases but it was worthy of note that no reaction such as an acute febrile attack had been noted, neither had there been any shock nor rash following the injection of the remedy. It was too early to be prejudiced either for or against neo-salvarsan in septic scarlet fever but it merited an extensive trial. Whether or not antitoxin inhibited the action of neo-salvarsan could not at present be stated. If the case in which the prognosis was now grave could be saved the drug merited a further trial in septic scarlet fever.

## PRESENT DAY OPINIONS OF THE VALUE OF THE SO-CALLED INCLUSION BODIES IN SCARLET FEVER.

DR. MATTHIAS NICOLL, JR., presented this paper. He stated that Döhle was of the opinion that these bodies would be found pathognomonic for scarlet fever and Kretschmer of Berlin shortly afterward confirmed his findings. Dr. Anna Williams and the writer had undertaken a study at the Research Laboratory of the Department of Health and had come to the conclusion that while Döhle's claim of specificity for them was not justified, since identical findings occurred in a number of other conditions, nevertheless the determination of the presence of these bodies was of decided value to the clinician in helping him to make a differential diagnosis between scarlet fever and conditions which frequently simulated it. This position they still maintained in spite of the adverse opinion of many observers and of the fact that a more extensive study of the very mild cases of scarlet fever and of control cases of other conditions had led to a somewhat lessened regard for their value.

The literature on the subject had become so voluminous that only a cursory review of it was possible. Professor Kolmer of Philadelphia and other writers including himself had little to say of Döhle's work. Bongartz of Nuremburg, in a study of eighty cases, including twenty-one normal bloods and the remainder of scarlet fever, diphtheria, measles, pertussis, and even diarrhea, found inclusion bodies in 81 per cent. of normal blood, and in 91 1/2 per cent. of the others. He stated that in the blood of children inclusion bodies are found in the majority of cases, and that they were greatly increased in febrile conditions and therefore could not be pathognomonic of scarlet fever. Glomset went still further, in the *Journal for Infectious Diseases*, November, 1912, stating that by shaking up normal blood the bodies might be found to increase in number. Contrary to all other observers he made no distinction between the so-called inclusion bodies and detached or pediculated portions of the nucleus, notwithstanding the difference in their action toward various stains. He believed that the bodies reached their maximum on the fifth day which he regarded as the height of the disease. His photograph of measles blood, said to have been from a hemorrhagic case, differed in no respect from the blood seen in an early case of pronounced scarlet fever.

Belak of Budapest believed that only when a suspected case of scarlet fever showed no inclusion bodies in the blood could this disease be excluded, the presence of inclusion bodies in any case having no value for diagnostic purposes. The most recent article was that of Granger and Dole of London, who examined a large number of scarlet fever cases and controls and found that a carbol methyl blue stain gave better results than the generally used Mansas, and stated further that Döhle's inclusion bodies would probably be found in every true case of scarlet fever during the first four days, and that the absence of these bodies practically excluded

this disease. They found them, however, in a large proportion of cases of diphtheria, measles, and tonsillitis, and therefore believed that they were of no value in making a differential diagnosis between these diseases and scarlet fever. A number of their measles cases were complicated by bronchopneumonia but some uncomplicated cases showed inclusions. They were not found in toxic rashes.

In contrast to these opinions, Kolmer of Philadelphia was in essential agreement with Kretschmer and themselves. He pointed out that in diphtheria during the first four or five days typical inclusions could be found in quite a large percentage of the cases, and after that but seldom. This fact had escaped them in their first studies, but he had since been able to confirm it. Kolmer found the inclusions in the majority, but not all cases of scarlet fever in the first few days and regarded them of value in diagnosis. Kretschmer, in a second communication in November, reiterated his belief in the value of the bodies, and stated, that with the exception of septic conditions, those in which they were found other than in scarlet fever were not likely to be confounded clinically with the latter.

Dr. Nicholl said that he believed that this diversity of opinion was to be accounted for by the fact that the majority of workers had chosen to regard a given case as positive if, after prolonged search one or two polymorphonuclears showed a single body of whatever size or shape, thus using the term in an absolute rather than in a relative or quantitative sense. It was true that by examining a great many cells even in normal blood an occasional inclusion might be met with.

At the Research Laboratory they had been in the habit from the beginning of expressing an opinion of a given blood by using a series of plus marks from four to one according to the number of cells showing inclusions and the total number of inclusions, and the minus sign to designate a case in which few were found, but not sufficient to justify a diagnosis. Many observers had drawn their conclusions solely from the blood sent to the laboratory without clinical data of the illness from which the patient suffered. From his experience he believed that from a study of this kind no really definite conclusions could be reached. Their work had been strictly controlled by a personal study of the patients.

During the past year they had continued to study the inclusion bodies and had now examined from three to four hundred cases of scarlet fever blood usually taken in the active stages of the disease, that was, during the first week. Until a short time ago he had felt convinced that every case of true scarlet fever up to and including the fourth day would show in the blood a sufficient number of inclusion bodies to justify a differential diagnosis between scarlet fever and such conditions as, in his opinion, showed no such findings. During the past winter there had been an unusual number of very mild cases of the disease with very little involvement of the throat, low fever, and atypical tongue. In a recent study of thirty-three such cases, a number of which were examined daily



from the first to the fifth day, five showed too few inclusions to justify calling the blood smear positive. Two of these cases were doubtful and were probably cases of German measles, the others were undoubtedly mild cases of scarlet fever. In some instances the inclusions were more pronounced on the third or fourth day than on the first. In a small percentage of true scarlet fever practically negative results might be expected. Pathological conditions which, even in the hands of expert diagnosticians, might justifiably be confused with scarlet fever were sepsis, showing a scarlatiniform eruption, and just as there was absolutely no way to differentiate scarlet fever from sepsis by clinical symptoms, so unfortunately were the blood pictures identical.

Serum rashes showed no inclusions in the blood, that was, none that would serve to confuse the disease with scarlet fever. If such inclusions were present in a case of diphtheria they might be due either to diphtheria for which antitoxin had been given, or to the streptococcus infection associated with it. Therefore positive findings at this period were of no value. Negative findings practically excluded scarlet fever. After this period a positive finding should make one very suspicious of its existence. Toxic rashes due to other causes than serum showed no inclusions. German measles showed no inclusions; this statement was based on an examination of forty or fifty cases in several of which a decidedly red throat was present. Measles blood as peculiar. In an examination of some forty cases of uncomplicated measles from the pre-eruptive stage through the first week, not one had shown a blood picture similar to that of scarlet fever, although it was true that there were regularly present tiny granules which were quite unlike the relatively large masses found in scarlet fever. For this reason he thought the picture of measles blood accompanying the article of Dr. Glomset was misleading as typical of uncomplicated measles.

As to acute follicular tonsillitis, the necessity for a differential diagnosis between this condition and scarlet fever might occasionally arise and from the fact that the streptococcus was not infrequently associated with the staphylococcus and other organisms in tonsillitis and one would expect that the inclusion bodies would occasionally be found. The blood examinations in tonsillitis had not been sufficiently numerous to justify a conclusion, yet in the fifteen or twenty cases studied no typical inclusions had been found. A condition that might best be described as streptococcus angina and which clinically resembled the angina of scarlet fever could not be distinguished from the latter by the blood examination as typical inclusion bodies were regularly found. The cases were usually suspected of being diphtheria but the cultures showed a great preponderance of streptococci; then scarlet fever was anticipated and a rash was searched for without result. In his opinion it was safer to regard these cases as atypical examples of scarlet fever and to protect others from exposure. That these bodies might be found in certain pneumonias, erysipelas, pulmonary tuberculosis of an active type, typhus fever, and other conditions

was not pertinent to the inquiry regarding their value as a means of differential diagnosis between scarlet fever and a disease resembling it, provided that neither was complicated by one of the diseases mentioned. This method of differential diagnosis had been put to a practical and very exhaustive test and had given decided satisfaction.

As an example of a case in which it would prove of great service the following may be cited. A child became ill with diphtheria, was given antitoxin, and isolated. Ten days later a scarlatiniform rash appeared which was regarded as due to antitoxin. The child was allowed to return to her brothers and sisters, no blood examination having been made. Four days later two of these contracted scarlet fever, both dying, one of scarlatinal nephritis. Here a simple blood examination might have saved two lives.

There was at present no short cut to the diagnosis of scarlet fever. All the clinical symptoms and signs must be taken into consideration in reaching a conclusion and among them the determination of the presence or absence of inclusion bodies in the blood had a not unimportant place.

#### RETURN CASES OF SCARLET FEVER.

DR. LEWIS A. SEXTON believed that what he was going to say would not meet with the approval of many present, but these were his personal observations covering a period of six years during which time he had had under his care 10,093 cases of scarlet fever.

How long were scarlet fever patients to be isolated and quarantined had been a debatable subject for more than three centuries. In no condition known to the profession was it so difficult to affirm that the period of infection had passed. Realizing this they continued to isolate the patients until they were entirely free from nasal, pharyngeal, and aural discharges. This necessitated extending the isolation period far longer than would otherwise seem practical and covered a period of eight to twelve weeks or even more. Dr. Sexton said he had in mind one child whose nasal and aural discharge persisted for over a period of eight months. They were probably as far from a specific for the disease to-day as they were when Ingrassias of Palermo (1560) first described it. They did know, however, that by individual attention to the toxic cases, the mortality in scarlet fever could be markedly reduced. Their hope for the present lay in preventive measures and constant individual attention to the septic types which were overwhelmed by the absorption of toxins which were liberated along the respiratory and alimentary tract. Particularly did this apply to the nasal, pharyngeal, and upper esophageal structures. As they became better acquainted with the morbid conditions which accompanied scarlet fever they found the quarantine period in these cases lengthening year after year. While the sanitary code required an isolation period of thirty-five days, their period of detention extended

over forty-two days on the average. Even with its prolonged isolation period they got a small percentage of return cases, notwithstanding the strictest precautions observed. Their patients were never permitted to leave the hospital so long as a mucous discharge persisted. Nasal discharges appearing late in the course of the disease, often long after the period of quarantine had passed, seemed in a majority of their infecting cases to have been the source of transmission. A peculiar feature, and not as might be expected, was that a majority of these cases passed through the regular course of the disease uncomplicated. This led them to believe that the infection might be carried and remain in a quiescent state for weeks and then become active, due in most instances they believed to contracting a cold and a subsequent rhinorrhea. This condition was undoubtedly influenced by the season as most of these cases occurred during the winter months; this might also be explained by the fact that all cases exposed themselves more or less after being released from a long detention in the hospital.

During the past three years they had had sixteen return cases that were traceable to some member of the family who had been discharged from the scarlet-fever hospital. In each of these cases Dr. Sexton personally visited their homes and carefully examined the discharged patient, and in every instance he found the discharged patient suffering from a rhinorrhea. In only two cases was there present any desquamation and this was only slight and on the soles of the feet. He recalled the case of a child of two years who had a very mild uncomplicated type of the disease and was discharged clean and free from mucous discharges after a detention of thirty-eight days. Four days after her discharge her mother came down with the most virulent type and died three days later. Another case in a child one and a half years old was admitted from the Babies' Hospital; the onset of the disease had been so mild that it was unnoticed until the patient reached the desquamation stage of the disease. The child was ill thirty days before admission and was discharged fifty-two days later. There were no complications. Seven days after his discharge his mother contracted the disease and died the same week. Dr. Sexton simply cited these two cases to show that the most virulent type of the disease could be contracted from one that was correspondingly mild, and that in a large percentage, if not all of the infecting cases, the morbid condition present was rhinorrhea or otorrhea. There was no authentic proof justifying the old and popular theory that desquamation was infectious. The fact that the infectivity began prior to and frequently continued long after desquamation had ceased, that desquamation might continue far beyond the infectious stage of the disease, which was proven by the fact that patients covered with desquamation had mixed freely with others without infecting them, led him to the conclusion that true desquamation played no part in the transmission of the disease. He could not say this positively of the early desquamation which occurred in cases where the erythema was so intense that desquamation came with the disappearance

of the sudamina, for in all these cases there was a subsequent desquamation which was undoubtedly the true one and noninfectious.

They believed, and their observations justified this conclusion, that as long as nasal and aural discharges existed, just so long would cases of scarlet fever be infective.

#### DISCUSSION.

DR. WILLIAM P. NORTHRUP would take exception to the remark made that German measles was never a severe disease in young adults. He could remember several that he had seen with temperatures of 104° F. and who were delirious. Dr. Northrup recalled the instance of a delirious athlete, an oarsman, with whom it was very difficult to argue successfully as to what he should do and what he should not do. A child whom he had treated for genuine measles, he treated subsequently for German measles, and the whole family had German measles and some of those afflicted with German measles were as sick as when afflicted with the ordinary measles. As a rule they had a somewhat lower temperature and ran a shorter course. "Bob-tail measles" for this reason was what they termed it in the hospital.

Dr. Northrup also took exception to the statement that German measles was not contagious in the usual sense. The house physician at the Foundling Hospital not feeling well thought he would go to his home in Maine; after he had been home fourteen days all his family came down with a little rash and alas the whole bunch came down with the disease on the fourteenth day after exposure. Dr. Northrup, was pleased to hear it stated that the desquamation was no longer considered to be an infecting agent. He also believed that the communicability of scarlet fever was less feared in their wards to-day than it was a few years ago. At the Presbyterian Hospital occasionally cases crept in and got the start of them. Naturally they made the diagnosis as soon as they could. He believed that these patients could be technically isolated in the middle of the ward and kept perfectly safe. He believed he could safely place a case of diphtheria in one bed, a case of scarlet fever in the next, alternating them down the ward; from a clinical point of view he would treat them successfully and they could run the whole course of the disease together in the one ward and without danger. He, therefore, felt convinced that the communicability of the disease was very limited. They should be separated by a space and possibly a screen. The striking distance was shown when the patient sneezed or coughed. He was glad that the old boggy or bug-bear regarding the carrying of the scales on or in letters and causing the recipient to come down with the disease, scarlet fever, had been exploded. He concluded that, in a word, the diseases which we are now discussing are communicated more or less readily by near approach or by contact. Kissing, coughing, sneezing, and handling, in fact, are the communicating agencies.

DR. HENRY W. BERG said that this year German measles seemed

to be quite epidemic. With regard to the symptomatology of the eruptive stage of this disease one of the essential symptoms he wished to emphasize and this symptom was almost pathognomonic, namely, the enlargement of the chain, of glands in the posterior triangle of the neck, along the anterior border of the trapezius muscle on each side. This chain of glands was not enlarged in scarlet fever but was enlarged in German measles both of the morbilliform and scarlatiniform types. Dr. Berg wished to make the assertion that this was a very valuable sign to look for.

Another subject which had interested him very much was the treatment of scarlet fever with salvarsan or neo-salvarsan. The most important quality of such remedies as diphtheria antitoxin and salvarsan was their specificity for the diseases for which they were the respective remedies. A physician in New Haven some years ago advised the treatment of cerebrospinal meningitis by diphtheria antitoxin, claiming that he had found this treatment valuable empirically. While his claims were not confirmed the serious aspects of such recommendation was that it encouraged the empirical use of specific remedies for diseases for which they possessed no specificity. It was equally illogical to use chemicobiological remedies empirically for diseases for which they were not specifically remedial. The use of salvarsan and neo-salvarsan in the treatment of scarlet fever was based upon the fact that the blood of scarlet-fever patients in a small proportion of cases reacted positively to the Wasserman test. This was not logical reason for believing that salvarsan be a remedy for scarlet fever. Dr. Fischer was to be congratulated for having shown that practically neo-salvarsan was not valuable in the treatment of scarlet fever if his results might be interpreted in that way.

DR. H. B. SHEFFIELD called attention to a clinical sign observed by him in the great majority of cases of German measles which he believed might be very helpful in the differential diagnosis between rubeola, rubella and scarlatina. This symptom consists in the manifestation of free perspiration during the entire course of the disease. In other words, whereas in measles and scarlet fever, the skin is invariably hot and dry, in German measles the skin is warm and very moist, nay, often bathed in perspiration—of course, without the administration of diaphoretics in the way of hot drinks or medicines. This symptom could readily be explained by the fact that in German measles not only were the lymph glands affected but the sweat glands as well. Dr. Sheffield noted this symptom about eighteen years ago during the simultaneous prevalence of a large epidemic of rubeola, rubella, and scarlatina at the Hebrew Sheltering Orphan Asylum, and he had been able to confirm his observation on numerous occasions since then. He had called attention to this symptom several times, recently again in his "Treatise on Diseases of Children," but apparently it had been overlooked. He hoped, however, that the members of the Section would take this symptom under consideration when confronted by a doubtful case of German measles.



He also desired to add that in some cases of German measles, the spleen was distinctly palpable even though the general course of the disease was very mild.

DR. L. E. LA FETRA called attention to one sign which was found in German measles of the morbilliform type, the punctate character the rash. The differential diagnosis between German measles and of scarlet fever was sometimes quite difficult.

DR. MINOR stated that Dr. Noguchi examined from 300 to 500 cases of scarlet fever and all gave a negative Wassermann reaction except one case. This patient developed a bullous eruption and was treated by the house staff as a case of syphilis. That was the only case out of this large number examined that showed a positive Wassermann reaction. Dr. Minor brought up this point in connection with what was said regarding the use of salvarsan or neo-salvarsan.

DR. MATTHIAS NICOLL, JR., speaking of the enlarged posterior cervical glands as being one of the diagnostic points in German measles, said that they should not be misled by them because they might be enlarged from a scratch and consequent infection.

DR. HENRY W. BERG said that he referred to the chain of glands along the border of the trapezius muscle.

DR. LOUIS FISCHER emphasized Dr. Sexton's point regarding the conveyance of the disease by a rhinorrhea or otorrhea; these conditions should be removed as soon as possible.

DR. LEWIS A. SEXTON said there was one point to which attention had not been called, namely, the color of the lesions. In German measles there was a violaceous color which was not present in scarlet fever.

#### RECENT INVESTIGATIONS INTO THE ANTITOXIN CONTENT OF THE BLOOD IN CASES OF DIPHTHERIA AT DIFFERENT TIMES.

DR. WILLIAM H. PARK said that about three years ago a study of the absorption of antitoxin from the subcutaneous tissues led him to the conviction that the proper way to give antitoxin in diphtheria was to inject at the earliest possible moment in a single dose the required amount. Since that time he had with the cooperation of Drs. Sexton and Wood of the Willard Parker Hospital, made a study of the antitoxin content of the blood in persons sick with diphtheria after injections of antitoxin. Dr. George P. Biggs carried out the animal tests. During the last few weeks results had been obtained from four healthy laborers who were each injected with 10,000 units of antitoxin. Hour by hour, and day by day, the increase of the antitoxin content of the blood of these men had been watched. A curious fact about these four men, was that three had some antitoxin in the blood, before the injection. One had as much as 0.3 of a unit per cubic centimeter of blood. Just why this was present it is hard to understand. The results in two men were given below. They were chosen because they were the



two extremes; one weighed 125 pounds, the other 260 pounds. By the end of three hours after the subcutaneous injection of 10,000 units, the small man showed 0.1 of a unit, the larger man 0.4 of a unit per cubic centimeter. The excess in the larger man was partly due to the fact that the latter's blood was slightly antitoxic at the start. By the end of the sixth hour the small man showed 0.2 of a unit, the larger 0.55 of a unit. By the end of the ninth hour the smaller man showed 0.25 of a unit, the larger 0.6. By the end of twenty-four hours, the smaller man showed 0.75 and the larger 1.50 of a unit. By the end of forty-eight hours the smaller man showed 1.6 and the larger 1.75 units. By the end of the ninety-sixth hour the smaller man showed 1.6+ and the larger 1.85 units. Until the end of the second day, therefore, there was a continuous increase in the antitoxic content of the blood. At first this was a rapid and then later a slower accumulation; for two days more the amount remained stationary and then the amount gradually dropped until at the end of two weeks disappeared. These two cases illustrated the fact that the antitoxic content of the blood is not always proportional to the quantity injected and the size of the individual. In this case the smaller man's blood is less in antitoxin content than the larger.

Dr Park presented some charts illustrating the accumulation of the antitoxin in the blood of treated patients. In all, during the first forty-eight hours there was a rapid rise and in the majority the antitoxin continued to increase during the first three or four days. In two cases there was a rapid production of the antitoxin by the patients' tissues. One case was very remarkable in that some 60 units per cubic centimeter developed. Most of the cases developed very little, one-third, one-fourth and one-eighth of a unit per cubic centimeter being the usual amount. What was produced in the patients lasted for months thus differing from that injected, which came from the horse.

Another chart showed that the intravenous injection gave an immediate accumulation in the blood. In the first hour this was 100 fold as much as for the subcutaneous way. An intravenous injection probably gave at least ten-fold the effect on the diphtheria as the same number of units given subcutaneously.

A recent report stated that the concentrated form of antitoxin was less rapidly absorbed than the nonconcentrated, but Dr. Park found there was no appreciable difference. In the use of the concentrated form there resulted sometimes slight local irritation, and where this irritation happened there was a slightly slower absorption.

They had been interested in testing the amount of the toxin in the blood of the cases as they entered the hospital and they had found there was but little in any case of diphtheria. Most of the cases that entered the hospital had blood already feebly antitoxic. These results clearly demonstrated that large amounts of antitoxin are not given because of the large amount of toxin in the body, but because it was necessary to get antitoxin quickly to the various tissues. The antitoxin passes slowly from the blood to the tissue

cells. Twelve hours after a sufficient dose there was probably no toxin left in the body except possibly in the diseased local tissues. Dr. Park emphasized the importance of giving enough antitoxin at the first dose, especially in the malignant cases; in these a large dose might save where a small dose either single or repeated might not. In these cases an intravenous injection was indicated. Time was very important and it was better for the patient to give a small dose early than to wait and give a larger dose six hours later. In moderate cases small doses would save life as well as large doses but the recovery would not be so prompt.

At the Willard Parker Hospital they had gradually come to use a single large dose; this was decided upon after much experimental work. Last year, only 10 per cent. of the patients received more than one dose.

Dr. Northrup asked Dr. Park about anaphylaxis. He was also asked about the size of the initial dose of antitoxin.

Dr. Park, in answer to the second question, said that at present in the milder cases they gave a single dose of from 3,000 to 5,000 units; in the moderately severe cases a single dose of 10,000, while in the very bad cases they gave from 20,000 to 30,000 units and this usually intravenously. In the intubation cases both subcutaneous and intravenous injections had been employed, but no marked differences in the results were apparent. The death in these cases usually depended upon whether or not the children had pneumonia at the times treatment was begun. In all severe septic cases the intravenous method was employed when possible and the average dose was 20,000 units.

So far as anaphylaxis was concerned Dr. Park could give no statistical information. Urticarias occurred about as frequently with the refined as with the whole serum. Severe rashes were very rare. Personally he felt the danger of anaphylaxis had been much exaggerated and did not let a fear of it prevent the giving of immunizing doses in infected families. Some opposed this because it might become necessary to inject such persons with serum at some later period. He felt that this was a mistake. No death had occurred in New York City so far as he knew because of the injection of the refined serum. This covered a period of five years. Two deaths had occurred at an earlier period when the whole serum had been used.

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## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN.

**Treatment of Vaccinal Ulcers.**—L. A. Sexton (*Arch. Ped.*; 1913, xxx, 139) says that there have been vaccinated in the Willard Parker Hospitals, during the past four years, 45,735 persons. Naturally out of this vast number there have been many infections, due to

the introduction into the wound of some extraneous microorganisms which produced the tissue necrosis. With a view to lessening the number and persistence of these vaccinal ulcers the use of serums locally was begun some three and one-half years ago. From the first use of antistreptococcus serum a marked improvement in these indolent, punched out vaccinal ulcers was noted and the writer has yet to see one that has not responded readily to the constant application of antistreptococcus serum used locally in the form of a wet dressing. The wound is filled with the serum, this is covered with a small wet dressing of same, and over this is placed an oiled silk dressing in order to maintain the moisture as long as possible. The dressings when dry become very hard and stiff. In order to obviate the unpleasantness caused by this the oiled silk is removed and the dressing remoistened, without disturbing it, three or four times daily. The rapidity with which these indolent ulcers respond to this form of treatment is remarkable. The results from the use of other serums, including normal horse serum have not been satisfactory.

**Boiled Versus Raw Milk.**—J. Brennemann (*Jour. A. M. A.*, 1913, lx, 575) presents an experimental study of this subject. He does not advocate the use of boiled milk, or of raw milk as a routine measure, but believes that each has its indications. He endeavors to show that raw milk and boiled milk are clinically very different foods; that the most striking difference between them as shown experimentally is in their reaction to rennin; that the casein of raw milk, unless modified so that it will not form hard, large, coagula offers serious difficulties in digestion that are not present in boiled milk; and that these differences between raw and boiled milk should always be borne in mind in comparing clinical, therapeutic and experimental results in infant-feeding and elsewhere.

**Flagellate Dysentery in Children.**—Mello-Leitas (*Brit. Jour. Child. Dis.*, 1913, x, 60) has found flagellates in thirty-two out of fifty-four cases of dysentery in which the stools were examined in Rio de Janeiro. He says that to the other forms of dysentery a primary flagellate dysentery is to be added. Flagellate dysentery is due to *Trichomonas intestinalis* and *Lamblia intestinalis*, either separately or in combination. Flagellate dysentery is a benign disease, and the most frequent form of dysentery in infants. *Trichomonas* and *lamblia* are pathogenic to infants under three years. Flagellate dysentery does not depend on the infant's diet. A diagnosis between flagellate and other dysenteries by the clinical phenomena only is impossible in most cases, but very easy by microscopic examination of the stools. Treatment is simple; magnesium sulphate (7 per cent.) and water diet (in infants under two years) or milk (over two years) will be efficacious in most cases. Sometimes, however, enemata of collargol (1 per cent.) or electrargol are required.

**The Inclusion Bodies in Scarlet Fever.**—Granger and Pole (*Brit. Journ. of Children's Diseases*, Jan., 1913) examined a large number of blood films from various cases of infectious diseases in children, and found that except in the extremely fatal toxic type

of scarlet fever, Dohle's inclusion bodies will probably be found in every true case of scarlet fever during the first four days of illness. The absence of the bodies practically excluded scarlet fever. The bodies are present in almost every case up to the fourth day, after which they appear with lessening frequency and are absent in most cases after the eighth day, though in some few cases they may be found as late as the third or fourth week. The bodies are present in quite a large proportion of cases of diphtheria, measles and tonsillitis. Therefore the presence or absence of the bodies is of no use in making a differential diagnosis between these diseases and scarlet fever. The bodies are found in most diseases caused by ordinary pyogenic organisms, especially if streptococci are present. The bodies are absent in toxic rashes. The authors believe that it is impossible to diagnose scarlet fever from film examination alone.

**Diagnosis and Pathogenesis of Duodenal Ulcer in Infants.**—Herman Flesch (*Jahrbuch f. Kinderheil.*, Bd. xxvi, H. 5, 1912) says that duodenal and peptic ulcers have been considered very rare in infants. Out of 364 cases seen at the Kinderasyl at Budapest, 3 per cent., that is eleven cases, showed at the postmortem peptic ulcers, none of which were diagnosed during life. These children were from six weeks to six months of age. Most of the ulcers were located in the upper part of the duodenum near the pylorus. This would indicate that duodenal ulcers are not rare. The author had a case in which the ulcer was diagnosed during life in a three months old child, who was extremely emaciated after an attack of acute indigestion and had signs of hydremia. The ulcer showed itself by the sudden appearance of bloody stools, with hypothermia, frequent and weak pulse, and signs of collapse. All attempts to relieve the heart weakness were without avail, anemia increased, and bloody stools and weakness ended the scene. As to the cause of such ulcerations previous disturbances of digestion play a large part, especially those of a vasomotor nature. Inanition and hunger cause disturbances of function of the mucous membrane and slight disturbances of circulation lessen the resistance to the action of the pepsin on the lining of the stomach.

**Arrhythmia in Healthy Children.**—Ragnar Friberger (*Jahrbuch f. Kinderheil.*, 1912) gives his observations on irregularities of the heart in healthy children. He believes that a considerable amount of irregularity is consistent with perfect health in children. His observations included examinations of 321 children, aged five to fourteen years, of whom sixty-four were reexamined later. The children were measured and weighed, and their blood pressure was taken. Also tests were made for albumin, and heart and lungs were carefully examined. Not one of the 321 had an absolutely regular pulse. There were differences in the length of the beats and the height of the curve. There was a moderately regular pulse in 37.4 per cent., a very irregular pulse in 12.2 per cent., and a moderately irregular pulse in 50.4 per cent. In most of the cases there was an alternation of long and short pulse. In others the pulse was suddenly retarded at regular intervals. In others after a series of short

pulses a succession of pulse beats of double the length occurred. There is an evident relation of this arrhythmia with the variations of respiration seen in children. Their respiration is easily disturbed by exercise and by psychical conditions. The longest pulse beats were at the end of expiration or beginning of inspiration. The diagnosis of arrhythmia may be made by the feel of the radial pulse as well as by the tracing. It may be laid down as a rule that children otherwise healthy and having normal respiration and digestion have no heart lesion even when irregularity is observed in the pulse. There is another category of nervous children in which psychical disturbances account for irregularity of the pulse. It occurs also in children convalescent from infectious diseases or other severe illnesses, due to true heart weakness. The author concludes that heart irregularities are physiological in children from five to fourteen years of age. The cause of these irregularities is unknown.

**So-called Sodium Chloride Fever.**—B. Bendix and J. Bergmann (*Monatsschr. f. Kinderheil.*, Bd. xi, H. 8, 1912) have observed the so-called sodium chloride fever, which occurs after saline infusion, and it has appeared to them probable that it is due rather to bacterial infection than to the injection of common salt. They believe that there are in the water used for making the solution saprophytic germs which become virulent after entering the blood and thus produce the fever that follows saline infusion. Therefore they made experiments to ascertain the truth of their belief. They made salt solution out of freshly distilled water and injected it into seventeen nurslings. In all thirty-three injections were made. The temperature was taken frequently during twenty-four hours. Later twelve children received eighteen injections in the same manner. It was found that in the children injected with this sterile solution there was no rise of temperature at all. The authors recommend for the making of normal salt solution the use of distilled water.

**Serum Therapy of Melena Neonatorum.**—R. Franz (*Münch. med. Woch.*, Dec. 31, 1912) gives his experience in the treatment of hemorrhages in melena neonatorum. At the Frauenklinik at Graz from 1900 to 1911 there were treated thirty-five cases of gastrointestinal hemorrhage in new-born children. The mortality was 50.9 per cent. Injections of gelatin have heretofore been the best method of treatment, but even with the use of these there was a mortality of 62 per cent. The hemorrhage occurred in portions of the gastrointestinal tract entirely without lesions, therefore, there must be some failure of the blood to coagulate in these cases. The new methods of serum therapy seem about to give better results than we have heretofore had. Experiments in vitro and in animals have shown that the admixture of serum increases the coagulability of blood. The author has treated five cases of melena neonatorum by injection of blood derived from the navel. All the cases were cured, and in four of them the action was very rapid. For the purpose of obtaining the serum the cord of a healthy woman, after ligation of the end next the child, was allowed to bleed into a vessel



under aseptic precautions, and this serum was used for the injections. The injections were made, after disinfection of the skin by iodine, into the upper part of the thigh and buttocks, either subcutaneously or intramuscularly. The serum used was from one to four months old when used. The dose was 10 to 25 c.c. repeated when necessary. The author believes that he has shown the harmlessness of these injections and their therapeutic efficiency.

**Therapeutics of Uncontrollable Hemorrhages in Young Children.**—Kurt Bluhdorn (*Berl. klin. Woch.*, Jan. 6, 1913) believes that whenever we have an uncontrollable hemorrhage in an infant we have to do with a case of changed coagulation reaction. The blood no longer coagulates in the normal manner. The author recites three cases of uncontrollable hemorrhage of three different types in infants. The first was a case of melena neonatorum; the second of purpura abdominalis; the third of septic bleeding of the navel. In the treatment of these cases the author made use of the injection of serum, and as diphtheria antitoxin was at hand he employed that for the injections. Whipple has shown that coagulation is less than normal in melena neonatorum. In the author's case of abdominal purpura the coagulation was very slow and in the case of umbilical hemorrhage coagulation was also delayed. Whipple found fibrinogen and lime salts present in melena, therefore, absence of thrombin is probable in that condition. This was probably the case in purpura. The results of the serum injection were excellent and all three of the author's cases recovered. The doses used must be large. Lime salts were used in connection with the serum injections.

**Rheumatism in Childhood.**—According to F. J. Poynton (*Practitioner*, 1913, xc, 389) the actual causal agent of rheumatism is a diplococcus and the avenue of infection is through the tonsils. In childhood, rheumatism shows the usual characters of one of the great infections, in being more widespread and more general in the young tissues. The articular lesions, though frequent, are less severe. Heart affections are more frequent, and rheumatism for this reason more fatal; multiple cardiac lesions are commonly met with. Nervous symptoms, notably chorea, are more frequent. Subcutaneous nodules are more frequent. Sweating is less frequent. Anemia is more profound. There is a greater tendency to drift into the rheumatic state. Hyperpyrexia is very rare. The various modes of onset of rheumatism are of great clinical importance. The most obvious and the most usual is the acute. The child has a cold with some sore throat and fever. Three days later, there follows polyarthritis and some carditis. Another frequent mode of onset more gradual, but not less conclusive, is the appearance of chorea, with a history of vague pains and some dilatation of the heart. Fulminating cases commence with shivering, vomiting and diarrhea, prostration, fever, and the rapid development of numerous manifestations, of which the most important is carditis. A fourth group of cases is that showing only one prominent symptom, of which chorea is probably the most frequent, for arthritis is more often associated with acute



cardiac lesions. The most deceptive of these solitary lesions is heart disease. A number of indeterminate symptoms are signs of a slight persistent infection: fever, fleeting pains, headaches, alteration in character, irritability and night terrors, loss of flesh, mysterious breathlessness, anemia, and erythemata. As to prognosis, an acute attack in a very young child is always serious if pericarditis develops. Cases that begin acutely with diarrhea and a rapid appearance of numerous manifestations are always dangerous. Fragile children who have a definite rheumatic inheritance—particularly if this be derived from both parents—are subject to a very destructive form of carditis, which need not be marked by any very acute symptoms or high temperature. There is a deadly persistence in the process with increasing anemia, and not infrequently the development of abundant nodules. Such a process, if it were to focus itself upon a single cardiac valve, would produce a malignant endocarditis, but in the child it takes the more diffuse form of a multiple rheumatic infection. The supervention of a severe chorea upon a severe carditis is usually fatal. Nodules usually point to severe heart disease, and, therefore, to a grave prognosis. The development of pericarditis in a case of recurrent rheumatism with severe cardiac damage is often the terminal event, and practically all the fatal first attacks develop pericarditis. Many cases of chorea recover perfectly, but the writer warns against the gradual onset of mitral stenosis if the attack is prolonged and particularly if it is repeated. The prognosis of rheumatism is influenced largely by the tendency to recurrence. No one can tell how severe a subsequent attack may be. As far as can be judged by the condition of the heart, mitral incompetence, if slight and well compensated, gives a favorable outlook. Mitral incompetence with a large feeble heart and symptoms of breathlessness and asystole is gloomy; such cases run a very unfavorable course in childhood. Slight mitral stenosis is compatible with a long and useful life. Progressive and severe mitral stenosis in childhood gives a very grave outlook for the future. Aortic and mitral disease combined are very serious when the aortic lesion is well marked; when this is only slight the cases fall into line with those of simple mitral incompetence. Primary aortic disease of severity is rare, but the outlook grave. External pericardial adhesions, which are almost always associated with a large heart, precordial bulging and signs of asystole on exertion, are very serious. Many cases of myocardial weakness without valvular disease, though obstinate, eventually do well; some of great severity are most intractable and may lead to permanent invalidism. Some cases of pericarditis make excellent recoveries, but the majority show also considerable valvular damage, and must be judged mainly by the severity of that damage. The cardiac muscle is very likely to be weak in such cases. Persistent tachycardia after rheumatism in childhood is a serious event. The explanation of its occurrence is at present obscure, but it is likely to be associated with a progressive mitral stenosis. Persistent anemia is a serious event. The treatment of rheumatism

is chiefly prophylactic, including good housing, care of throat affections, rest in convalescent homes after attacks of cardiac rheumatism, removal of diseased tonsils, careful supervision of sore throats, and warm clothing. Sodium salicylate will not prevent subsequent attacks. Rest is all important in the treatment of rheumatism. As to how long it should be continued, we must be guided by the appearance of a steady normal temperature, and the absence of any evidence of active lesions. After this, it depends mainly upon steady gain in weight, the establishment of a steady pulse, the disappearance of dilatation, or the appearance of satisfactory hypertrophy. With the absence of signs of active disease, the commencement of a gradual forward policy is generally approached with fair confidence, if the temperature, pulse, and cardiac impulse are carefully watched. Violent athletic pursuits must be avoided after a recent attack of cardiac rheumatism. Vaccine treatment is in the experimental stage.

**Treatment of Meningitis by Drainage of the Cisterna Magna.**—

I. S. Haynes (*Arch. Pediatrics*, 1913, xxx, 84) states that if a patient presents head symptoms, a rising blood pressure, venous engorgement and edema of the optic papilla, with the absence of the copper-reducing elements from the cerebrospinal fluid, the diagnosis is absolutely sure. The disease is septic meningitis. The end is certain, unless relief be afforded by instant, free and continuous escape from the skull of the excess of cerebrospinal fluid with its content of deadly bacteria and poisons. All the evidence points to the cisterna magna, the great subarachnoid space, as the one logical place where removal of pyogenic cerebrospinal fluid should be practised. He claims that relief of intracranial pressure is possible by this operation, and that such relief is without danger of cerebral hernia. Drainage is free and continuous. All of the writer's cases have died; but he holds that this shows only the need of earlier operation. He describes the technic employed. The opening is made at the space between the two poles of the cerebellum and between them and the medulla, the cerebello-medullary angle, or hiatus. It lies close beneath the occipital bone about 1 inch above the foramen magnum.

**Significance of Orthostatic Albuminuria.**—M. H. Bass and H. Wessler (*Med. Rev. of Rev.*, 1913, xix, 159) say that orthostatic albuminuria is a phenomenon of not at all infrequent occurrence. It is seen occasionally in children who otherwise appear to be absolutely normal, still in a large number of cases it appears to be only a concomitant symptom of a constitutional lack of development, the evidences of which can be found universally distributed throughout the body. The albuminuria is not even an essential symptom of this condition, as it may disappear from time to time, without any improvement in the subjective symptoms, which are of the type usually described as functional or neurasthenic. Conversely, the subjective complaints cannot be made to depend upon the presence of the albumin in the urine, for on appropriate treatment these symptoms may disappear, while the albumin persists. The treatment indi-

cated, therefore, is a general one, not a dietetic or postural one aimed at the albuminuria *per se*, but one to restore the entire nutritional condition of the child to a normal level, when it will often be found that the albumin will spontaneously disappear.

**Addison's Disease in a Boy Aged Ten Years.**—This condition is extremely rare in childhood. In the case recorded by F. Langmead (*Lancet*, Feb. 15, 1913) the pigmentation amounted only to slight diffuse brownness of the skin which had increased gradually for twelve months. For several months the boy had had attacks of diarrhea and had been slowly getting weaker. On the evening before admission, vomiting started abruptly, accompanied by restlessness, and followed by loss of consciousness. On admission he was unconscious, the elbows, wrists, and knees being rigidly flexed, and the fingers extended. The temperature was subnormal and the pulse rapid and weak. The abdomen was retracted. The knee-jerks were present, and the plantar response was flexor. Frequent convulsive seizures occurred until death. The suprarenals were almost completely caseous, and tuberculous foci were found in lymph nodes and the lungs. The heart weighed only 3 ounces.

**Preparalytic Symptom of Poliomyelitis.**—J. A. Colliver (*Jour. A. M. A.*, 1913, lx, 813) has observed in sixteen cases a symptom which he considers characteristic of the preparalytic stage of poliomyelitis and which has been mentioned by only a few writers. The symptom is a peculiar twitching tremulous or convulsive movement of certain groups of muscles lasting from a few seconds to less than a minute. The amplitude of vibration is greater than a tremor, not so constant and long as a convulsion, and more regular than mere twitching, yet it has some elements of all of these. It usually affects a part or whole of one or more limbs, the face or jaw, but it may sometimes affect the whole body. The symptom may easily be overlooked in the beginning as it usually lasts less than a second and unless the patient is disturbed does not recur oftener than every hour or so. Later the duration of the spells lengthens to a few seconds, recurring also at shorter intervals. This condition is often accompanied by a peculiar cry similar to the hydrocephalic. At times there is a slight convulsive movement, like a chill, during which time the child is apparently unconscious with eyes set for a few seconds, and then he apparently becomes perfectly normal again. This brief unconsciousness during which the child's eyes are set may occur without noticeable convulsive movements. There may be a twitching of the lips with tongue running in and out and a working of jaw, preceding bulbar cases. The tetanic contractions are not general and do not last for a long time. They usually involve a set of muscles with one or more of the counter muscles not affected. There is also a similar hypersensitiveness of the skin. The least stimulation of the skin is followed by slight convulsive movements with rigidity of the arms, fingers separated and wrist flexed. When the patient turns in bed, through either an external stimulus or an effort to coordinate, the movements are quick and jerky, accompanied usually with slight con-

vulsive movements of the limbs. The least noise produces in certain cases short series of convulsive movements similar to those in strychnin poisoning, only not so general.

**Experimental Studies of the Possibility of Communication of Infantile Paralysis through Lifeless Materials and through Flies.**—

Arnold Josephson (*Münch med. Woch.*, Jan. 14, 1913) gives the results of his experiments with materials handled or used by children as to the possibility of transmitting the virus of infantile paralysis. The experiments were made at the Hospital for Children's Diseases in Stockholm. The author gave to two very sick children compresses which were used as handkerchiefs during an entire week. He also allowed a picture book to circulate among the sick children, and allowed one girl to make a piece of fancy work with papers. He also allowed flies to bite patients. He infected a monkey with extract from the pocket handkerchiefs and the monkey developed the same symptoms as the sick children. The filtrates from extracts made from the picture book and other papers was injected intraperitoneally and intraneurally into other apes. Control animals were injected. The animals injected suffered from paralyses similar to those seen in children. With flies the author obtained only negative results. These experiments show that the virus of infantile paralysis may remain virulent on lifeless materials and be communicated by them.

**Tuberculin Diagnosis in Children.**—N. Stricker (*Monatsschr.f. Kinderheil.*, Bd. xi, H. 10, 1913) discusses the value of inoculations in the diagnosis of tuberculosis in children. The condition in most infants is an acute one; that the condition is also generally fatal would lead to the belief that infants are poor antitoxin builders or that the disease is more virulent. In the author's tests a comparatively small number of children were inoculated. His conclusions are that while the tuberculin reaction is supposed to be a specific one, there is great divergence between the results of the tuberculin reaction and the clinical and pathological observations. A positive tuberculin reaction in an infant is an excellent evidence of the presence of an active tuberculosis; in older children it is only a presumptive evidence of an earlier tuberculosis. Negative reaction in infants or children is no positive evidence of absence of tuberculosis. The skin reaction is positive in other acute diseases such as pneumonia and measles. Children with the exudative diathesis give most positive reactions. There is no relation between the intensity of the reaction and the severity of the infection. A careful, critical observation of the temperature reaction is necessary since it is present in so many other conditions in children. The so-called "herdreaction" is seldom seen, but is a positive indication of tuberculosis. A positive cutaneous reaction is of less value than the subcutaneous. The subcutaneous reaction is not altogether without danger, while the cutaneous reaction is perfectly safe. The value of the tuberculin reaction has been overestimated and must always be checked by the symptoms and general condition of the child.

**Treatment of Tuberculosis in Children on the Shores of the Mediterranean by Sea Baths and Sunlight.**—L. Rebillet (*Ann. de méd. et chir. inf.*, Jan. 1, 1913) describes the treatment given to tuberculous children at Cannes, and other sanatoria on the Mediterranean Sea, as carried out in some cases throughout the winter, even in the cold months. Before and after the sea bath most of the day is used for sun treatment, the parts being exposed to the unchanged rays of the sun for from one-half to three hours daily. The head is protected with a large straw hat. Under the influence of the red and infrared rays there is a reparative action, and a phagocytosis which is indirectly microbicidal. In white osteitis, necrosis, lupus, and tuberculous ulcerations there are slight redness and swelling, and increased suppuration. The skin becomes deeply pigmented, which the author considers a favorable prognostic sign. At once appetite returns, and digestion is reestablished and there is a rapid improvement of general health. Adeno-tracheobronchitis at once improves if superficial; the glands separate and decrease in size. After incision of suppurated glands they heal kindly. The author gives histories of thirty-two cases. He says that sea baths can be given all winter if commenced in October. Heliotherapy without instruments is effective in glandular, and osseous disease. It produces cicatrices remarkable for their solidity, suppleness, and whiteness. The skin looks absolutely normal. Immobilization should be used only when the joints are painful and inflamed. As soon as the articulation becomes painless and indolent the limb should be mobilized and exposed to the sun. As few operations as possible are done. Orthopedic treatment consists of progressive mobilization of the articulations, and massage of atrophied and paretic muscles.

**Indications for Heliotherapy in Tuberculous Peritonitis.**—D'Oelsnitz (*Ann. de méd. et chir. inf.*, Jan. 1, 1913) gives the histories of three cases of tuberculous peritonitis treated by him successfully by heliotherapy, and one that was not successful. Many observers have reported this same rapid curative action of the sun in tuberculous peritonitis, especially in the ascitic form, when treated early in the disease. Each of the three cases would have been considered at first as having a bad prognosis. The good effects of the treatment were shown by the complete disappearance of the clinical signs of tuberculosis in the peritoneum after from one to three months. The good effect of heliotherapy has been seen in large tracheobronchial adenopathies as well. Many long sittings of treatment may be given. The caseolcerous forms of tuberculosis with generalized lesions and rise of temperature are very favorably affected by heliotherapy, especially when combined with sea baths. Ascitic cases become encysted. This treatment may be used without fear in advanced cases and apparently very grave ones.

**Relations of Face Presentations and Spontaneous Infantile Birth Paralysis.**—L. Kaumheimer (*Monatsschr. f. Kinderheil.*, Bd. xi, H. 10, 1913) considers the occurrence of birth paralysis as a result of face presentations, its frequency, and probable cause. In a case of the author's,



after a face case that was spontaneously delivered, with no very severe labor, birth paralysis occurred in both arms, varying in degree on the two sides, and permanent in some groups of muscles. The muscles of the hands were especially affected. The author concludes that face presentations may result, through the deflexion of the head in paralyzes of the upper extremities. The paralysis may be symmetrical on the two sides. The paralysis is generally of the lower groups of muscles. Klumpke's symptoms have not been observed in these cases. Face presentations appear to be rather frequently the cause of spontaneous birth paralysis.

**Application of Radiology to the Study of Diseases of Infants.**—G. Variot (*Ann. de méd. et chir. inf.*, Jan. 1, 1913) discusses the various organs the condition of which can be diagnosticated by means of the  $x$ -rays. They may be used in the diagnosis of pneumonia and broncho-pneumonia of infants and to map out the area of the heart in the normal and pathological condition both with the child on the back and on the side. In general this method of examination is very useful in infants, since its results are at the same time precise and rapid, and allow us to appreciate instantly the condition of the organs. Placed before the fluoroscopic screen the infant is even more transparent than the adult, for his body is less thick, especially the abdomen. The child may be placed undressed on a flat surface, and fixed there by a suspensory arrangement so that the board may be placed vertically in front of the screen. This position is perfectly comfortable for the baby which can eat and drink in this position, and the movements of the organs be seen during the process. In the condition of hypotrophy the child has the age of his stature. This condition is seen in tuberculosis, or with rachitis. In exploration of the thymus the  $x$ -rays have been of the greatest value, since this gland intercepts the rays in a characteristic and special manner. It has also been found that the rays have the effect of reducing hypertrophy of the thymus and relieving the compression caused by its enlargement. The rays also permit an immediate differential diagnosis between congenital laryngeal stridor and compression by the thymus. The rays also show enlargements of pulmonary lymph nodes and tuberculous consolidation of the lungs. The position and shape of the stomach and intestines may be seen by the aid of a little bismuth added to the milk. Barret has shown by the rays that there may be dilatation of the stomach caused by hypoalimentation and atony of the muscles contrary to the generally accepted ideas, that it is due to superalimentation. There is a rare form of gastrectasis occurring with stricture of the pylorus which may be seen by radiography. The presence of fluids in the abdomen, especially ascites, may be demonstrated by the rays.

**Pneumonia and Status Lymphaticus.**—C. McNeil and J. P. McGowan (*Edinb. Med. Jour.*, 1913, n.s. x, 201) have studied a series of eleven outbreaks of febrile illness occurring within as many years in a boys' industrial school near Edinburgh. None of the administrative and teaching staffs were affected. Among the boys



there were twenty cases of short, acute and rapidly fatal illness; fifty-one of pneumonia of peculiar and irregular character; and 175 of an uncomplicated but severe febrile attack. The writers state that these cases of febrile illness are cases of pneumonia; fulminant in those acutely fatal; irregular (apparently lobular) in the group designated pneumonia; and abortive or latent in the third group. Pneumococci and blood-stained sputum were obtained from cases in each group during life; and pneumococci were cultivated from the lungs after death in the fatal cases. Of the twenty fulminant cases, twelve died within a day and all within two days from the onset, and autopsies were held upon fourteen. In a significant proportion of the autopsies various lymph-glandular tissues of the body were noted as enlarged, and in four out of five cases where the condition of the thymus was recorded this organ was hypertrophied. The writers advance the hypothesis that the rapidly fatal cases were examples of pneumonia occurring in boys in whom the morbid diathesis termed status lymphaticus was present. Status lymphaticus has hitherto been commonly associated only with cases of death occurring suddenly from a variety of trivial and insufficient causes. If the writers' conclusions are correct the term must be enlarged to cover rapidly fatal cases of infectious disease, usually termed fulminant, including such cases of pneumonia, of scarlet fever, of diphtheria, and probably of other infectious disease. The condition may also play a part in nonfatal irregular cases of pneumonia and it may very well be found to explain atypical forms of other bacterial infections.

**Pancreatic Ferments in Infants in Acute Intestinal Indigestion.—**

In a former communication by A. F. Hess (*Amer. Jour. Dis. Child.*, 1913, v, 268), which considered the pancreatic secretions in chronic malnutrition in infants, it was shown that the various ferments of the pancreas are normally secreted even in advanced instances of marasmus or atrophy. In the present study of an acute disease, of acute intestinal indigestion, or alimentary intoxication, which was carried out also by the direct method, by the use of the duodenal catheter, the lipase was found deficient, although the two other pancreatic ferments were present in considerable amount. The deficiency of lipase seemed to be to some degree characteristic of this disturbance; it is not a general characteristic of all febrile conditions, and was not met with in pneumonia or empyema. It is possible that the lack of lipolytic activity in this disease should be correlated with the clinical manifestation of fat intolerance, and the metabolic studies showing a deficient absorption of fat.

**Alimentary Anaphylaxis for Eggs.—**Ed. Lesné and Ch. Richet (*Arch. de méd. des enf.*, Feb., 1913) says that anaphylaxis for eggs occurs generally in young children, sometimes combined with anaphylaxis for milk. It is generally shown after raw eggs have been administered in considerable amounts. When eggs are mixed with flour they are better borne. Both white and yolk cause this phenomenon. Slight signs of anaphylaxis may be seen in adults, while in children its manifestations are acute and alarming. Anaphylaxis is

more often seen in children who have chronic indigestion, and is shown by cutaneous and vasomotor symptoms such as urticaria, prurigo, eczema, and partial edemas, migraine, and gastrointestinal troubles. In severe cases the onset is sudden, after indigestion, from the use of small quantities of eggs. There are nausea, violent vomiting, pain in the abdomen, and diarrhea, followed by collapse and small pulse. Albuminuria, asthmatic symptoms, convulsions, and dyspnea may all occur. The cure is slow with a prolonged convalescence. The symptoms last from five hours to three days. The prognosis is good. The essential cause of this effect is the previous indigestion, not the ingestion of the eggs. Treatment will consist of prevention, by means of care in the use of eggs in young children. A child under five years of age should not take more than one egg in twenty-four hours. Eggs should be cut off for some days, and when used again should be given in very small quantities. A purely vegetarian diet may be maintained for a time with good results.

**Vulvovaginitis in Children.**—At the Children's Hospital in Boston all cases of vaginitis are treated at a special clinic. E. R. Spaulding (*Amer. Jour. Dis. Child.*, 1913, v, 248) presents a study of eighty-three cases, fifty-six of which showed the presence of gonococci. She is convinced that all cases of vaginitis with a persistent discharge, which at any time has been profuse, are due primarily to the gonococcus. The disease may extend over many years, during which time there may be many recurrences, and that the periods of latency may at least be as long as eighteen months. Vulvovaginitis in children, although it may remain a local disease, is liable to any of the complications seen in adults. The most efficient treatment does not insure a permanent cure. The treatment which has given the best results is local treatment plus vaccine treatment. The local treatment corresponds to the treatment given a case of specific ophthalmia and consists in a cleansing douche followed by the instillation into the vagina of some preparation of silver. The usual directions given the mother are to use a two-quart fountain syringe in which there is a saturated solution of boric acid, and to which the smallest rectal tip is attached. This is to be given three times a day for at least ten minutes, as warm as the child can stand it, and with hot water added to it, that the temperature may be kept up. Following this three times a day, either argyrol 25 per cent., or a solution of another silver salt 1 to 1,000, is instilled into the vagina with a small rubber ear syringe. Gonococcic vaccine is also given, beginning with doses of 50,000,000 and increasing 25,000,000 until 400,000,000 is reached. The vaccine at present is being given once a week, but previously was given twice a week, but with less rapid increase in the dose.

**Significance of the Pyloric Reflex in True and Pseudopyloric Stenosis in Infants.**—D. M. Cowie (*Amer. Jour. Dis. Child.*, 1913, v, 225) presents a case study to illustrate how a regard for the opening pyloric reflexes may serve us in the medical cure of pyloric stenosis and pyloric spasm in young infants. In the normal infant's stomach an antacid may be employed to keep the pylorus closed and thus

impede the passage of chyme from the stomach by its action in delaying the opening reflex. Under certain conditions a paradoxical reaction may be said to take place; that is, an antacid may be employed to facilitate or expedite the passage of chyme from the stomach. When, for example, an antacid is added in proper amount to a hyperacid stomach, instead of delaying the opening reflex, as is the case in the normal stomach in which achlorhydria is the rule, the opening reflex is brought into play and kept in activity by an early series of short duodenal closings, brought about by the antacid overcoming the excess of acidity or delaying its rapid appearance. Thus, during the first part of digestion one could expect the stomach to empty itself quickly; during the latter part when the acidity has reached its height, more slowly. The writer believes that a very much larger per centage of the cases of infantile pyloric stenosis and pseudostenosis is associated with hyperchlorhydria than is usually conceded. In other cases the writer would control the pyloric spasm by regulated doses of antacids. It has been shown experimentally that the opening of the pylorus may be delayed in a normal infant by giving it an alkali in its food. A similar result might follow the administration of too much alkali in an infant with hyperchlorhydria, hence the importance of regulating the dose of acid by means of stomach analyses.

**Paralyzing Diphtheria.**—I. David (*Arch. de méd. des enf.*, Feb., 1913) says that there are some epidemics of diphtheria in which there are more cases of paralysis than is usually the case, and he considers that there is some variation in the toxins of the disease which causes this factor to be prominent. In an epidemic observed by him, the paralysis occurred in adults as well as children in some very severe and even fatal forms. Among the children there were all sorts of motor troubles, whether accompanied by angina or not. Paralysis of the velum and eye-lids, strabismus, paralysis of the neck, lower extremities, muscles of respiration, and dorsolumbar region occurred, but never of the upper extremities. Some of the cases of paralysis were found among the pupils of a girls' school in which all the pupils were examined and cultures from the throats were made. Two pupils had troubles of accommodation and strabismus. One of these had had a diphtheritic angina and had been treated with serum; the other had had an unimportant sore throat. These pupils showed no Klebs-Loeffler bacilli, while seven others who showed no signs had bacilli in the throat. The malignancy of the disease was greatest among the adults, while the majority of patients were children. The author believes that in this epidemic he had to deal with a Klebs-Loeffler bacillus of enfeebled virulence. There were a large number of fibrinous rhinitis cases, of chronic form, combined with an angina. The general symptoms were not marked. Possibly the nasal diphtheria and the paralysis had some relation. A bacillus which had chosen for its habitat the undesirable culture medium found in the nose, may have developed in a modified manner. It did not elaborate the usual quantity of toxin; but its paralyzing quality was marked. It was shown that in the cases in which the

angina was slight the contagion was less active. In cases in which the bacillus was not found in the throat it may have been present in the nose. The author believes that the bacillus that causes paralysis is always one of lowered virulence. The pathogenesis of paralysis should be sought in the enfeeblement of the germs. The serum treatment has begun to produce antitoxins and the bacilli have been attacked; therefore they are less virulent. This theory would account for the occurrence of paralysis late in the disease, when the organism has begun to conquer the poison.

**Multiple Calcification in the Subcutaneous Tissue.**—The patient of F. P. Weber (*Brit. Jour. Child. Dis.*, 1913, x, 97) was admitted on account of the presence of a large number of hard nodules in the subcutaneous tissue of the extremities and the portions of the trunk adjoining the extremities. Most of the nodules were smaller than an average pea, but some of them, especially those on the buttocks and about the knees, were much larger, the larger nodules having apparently arisen by the coalescence of several smaller nodules. The face, head, thorax and abdomen were practically free. Aside from these nodules the clinical examination showed practically nothing significant, excepting that the calcium index of the blood was 1.36 as against a normal average of about 0.9, and that the Wassermann and von Pirquet reactions were negative. The previous history included diphtheria, paresis of the lower extremities (diphtheritic?), a skin eruption resembling lichen ruber, pneumonia, abscess in the right axilla and one at the back of the neck, corneal ulcer, and otorrhea. The calcareous nodules occasionally become inflamed and softened; the skin over them becomes adherent, and if they were left to themselves thin purulent matter mixed with calcareous *débris* would doubtless be gradually extruded through a fistulous opening in the skin. Two such softened nodules have been excised and examined. The gritty material was found to consist of calcium carbonate and calcium phosphate. No tubercle bacilli or other microbes could be detected in the contents of the nodules. Culture tubes of glycerin-agar, glucose-agar and egg-agar were inoculated, but remained sterile. Another concretion was examined for uric acid but with negative result. Microscopical sections of a softening nodule show that the nodules consist of a sponge-like matrix of subcutaneous connective tissue, in the interstices of which the granular particles of lime salts are embedded. Skiagrams of the abdomen, thorax and axillæ give no evidence of calcification in the axillary, intrathoracic, or intraabdominal lymphatic glands, or in any of the thoracic or abdominal viscera. "Calcinosis" is probably the most convenient term to be used for the disease in question, and more advanced cases have been described under the headings "Calcinosis interstitialis," and "Calcinosis universalis." Apparently the chief danger is the risk of septic infection associated with the "breaking down" and discharge of the calcareous nodules.

**Chlorotic Type of Anemia in Children.**—Mathilde de Biehler (*Arch. de méd. des enf.*, March, 1913) defines the chlorotic type of anemia in infants as a state in which there are pallor, digestive,

circulatory, and nervous symptoms and a marked loss of hemoglobin, with a normal number of red cells. Cure is rapid after appropriate treatment is undertaken. The pallor is that of old wax, and the mucosa is pale, with a moderately fleshy condition. The internal organs are normal; there are anemic murmurs in the heart and vessels of the neck. The appetite is capricious, constipation is the rule, there are rarely vomiting and diarrhea. The child is apathetic, quiet, has enlarged glands, and sleeps poorly. This condition results when only milk is used, or when it is continued too long. Predisposing factors are heredity, anemia of the mother, overwork by the mother, bad hygienic conditions, and poor food. Premature birth, twin births, icterus of the new-born, umbilical and intestinal hemorrhages and digestive troubles are active causes of this form of anemia. There is a diminution of the iron reserve of the system. Marfan distinguishes two forms of anemia; the pure and the mixed. The simple form is due to congenital insufficiency, twin labor, and prolonged use of milk. In the mixed form are added the factors of digestive troubles, rickets, or infectious diseases. The treatment is improved diet and iron administered in large doses. Very soon there are a better color, more physical activity, and increased appetite, and final recovery is the general result. The blood examination of sixty-two children was the basis of this paper.

**Alimentary Saccharosuria in the Child.**—Gaujoux (*Ann. de méd. et chir. inf.*, March 1, 1913) says that in the child, as well as in the adult, saccharosuria may be normal. The child retains proportionally more sugar than the adult. It is not possible in the child to establish absolute figures indicating the saccharocystic capacity. In the normal nursling whatever proportion of sugar is changed by the intestine is taken up by the liver. There are few traces of glycosuria even when saccharosuria is marked. Histories are given of forty-seven cases. During the first six months of life the intestinal mucosa has the power of absorbing much saccharose. As soon as the limits of usefulness of sugar are lowered the prognosis of the affection in which the phenomenon occurs is made worse. There are two factors, intestinal and hepatic, in the production of saccharosuria.

**Syphilis of the New-born.**—M. E. Jeanselme (*Jour. de méd. de Paris*, March 8, 1913) relates a case of infection of the nipple of a healthy wet nurse by a syphilitic infant given her to nurse. The fissure infected was regarded by the attending physician as not suspicious until some time after its appearance, when the mother's own infant had already been infected. The author believes that every old-looking, wizened infant, even if not showing pemphigus at birth, should be considered suspicious and not given to a wet nurse until observation had shown it to be healthy. Physicians should be most careful in this matter of diagnosis, and of warning the wet nurse of her danger of contagion.

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#### A CRITICAL REVIEW OF THE MEDICAL AND SURGICAL TREATMENT OF PUERPERAL ECLAMPSIA.\*

BY

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THE treatment of puerperal eclampsia demands not only a deliberate and thorough consideration of its pathology, course and prognosis, but also a study of the results of the various methods of treatment which have been employed in the past as well as those of to-day. The writer, without due consideration of its merits, is not disposed to condemn or reject any method of treatment; nor without justifiable reasons is he inclined to endorse those means or measures which appear to him most successful in the management of this grave condition.

The generally unsettled opinions, widely entertained by practitioners and writers, as to the respective values of the medical and the surgical treatment of puerperal convulsions is the reason for this paper. It is well known that the writer is opposed to *any* unnecessary surgical interference in the treatment of puerperal eclampsia, and to be correctly understood, must preface his argument by a brief resumé of

*The Pathology of Puerperal Eclampsia.*—About 33 per cent. of all eclamptic cases develop during labor; in 50 per cent. the con-

\*Read before the Cincinnati Academy of Medicine, October 14, 1912, and the Section of Obstetrics and Diseases of Women of the Academy of Medicine of Buffalo, N. Y., November 19, 1912. An abstract of this paper was presented to the Obstetric Section of the Medical Society of the State of New York, at Rochester, N. Y., April 30, 1913.



vulsions appear during the eighth and ninth months of pregnancy prior to labor; in perhaps 15 per cent.\* the eclamptic seizures succeed labor. In the majority of instances, sometimes days or even weeks before the attack, kidney insufficiency may be recognized. In a few instances, and they are very few indeed, there may be no warning of the developing condition. In yet another group of cases, nephritis in some form exists at the time of conception and the patient passes through pregnancy, labor and puerperium, not without annoyance perhaps, but without convulsions.

Primiparae are more prone to this disease than multiparae. Plural pregnancies, hydramnion, hydatiform moles, hydremia and plethora are predisposing causes. Sudden changes in temperature, especially in damp weather during the spring or fall seasons, are mentioned among the contributory causes. The disease occurs more frequently in northern than in southern climates.

The severity, duration and frequency of the convulsive seizures vary, depending, unquestionably, upon the character and extent of the pathologic changes within the maternal organism. That the disease is fatal from its inception in some cases, has been amply proven by postmortem findings. In other instances the condition has been found to be amenable to treatment; and, in not a few cases, recovery has taken place without treatment.

The postmortem findings vary. The brain in some cases has been found anemic, in others plethoric. Edema of the brain and pia mater may be associated with anemia. Hemorrhagic exudates, if present, are usually found upon the cortex and at the base of the brain. Extensive apoplectic coagula are infrequent. The kidneys or liver are always involved and not infrequently both. The pathologic process is not inflammatory, but rather degenerative in character and consists principally of cloudy swelling, fatty degeneration and necrosis of the secreting glandular epithelium. In the kidneys it is the epithelium of the convoluted tubules which is affected; in the liver that of the acini. In connection with cell degeneration and necrosis, hemorrhages occur in the periphery of the acini and thrombi form within the inter- and intraacinous branches of the portal vein. The appearance of the liver varies with the intensity of the changes above mentioned. In some cases the pathologic changes may be recognized by the naked eye; while in others the microscope is essential for their detection.

Fatty degeneration and necrosis of the muscular fibers of the heart occur with moderate frequency. Here, as in the pathologic process sometimes found within the lungs, multiple thrombi may

\* In Peterson's table II the convulsions contained post partum in nearly 50 per cent. of the cases.

be discovered within the vascular system. The occurrence of emboli within the liver, the presence of placental elements, fat emboli and hemorrhages into the serous membranes, etc., are not always present, but if present are of secondary origin. Eclampsia *per se* bears no relation to them. All the changes found within the body of the eclamptic dead indicate the presence of a poison or poisons, and to date, all of the hypotheses submitted concerning the cause and character of puerperal eclampsia are based upon this theory and this theory alone.

Lever, Oliver Wendall Holmes, Sir James Y. Simpson all agreed that kidney insufficiency is the probable cause of the convulsions. Frerichs (1851) attributed eclampsia to the retention of urea and its subsequent change into carbonate of ammonia, ammonio-hemia. Traube and Rosenstein (1864) essayed to explain puerperal convulsions upon the basis of mechanical disturbances within the circulation—edema of the brain resulting from hydremia and hypertrophy of the left ventricle (Traube), the convulsions uremic in origin (Rosenstein). Spiegelberg (1868) based his theory of puerperal convulsions upon spasm of the renal vessels. Bouchard (1887), like Frerichs, declared the convulsions to be of uremic origin. However, subsequent experiments have confirmed the theory of autointoxication, but have completely failed to prove uremia the cause of the convulsions.

The most competent observers have proven, conclusively, that the urine of eclamptics is not so toxic as the urine of the normal pregnant; but that the blood serum of the eclamptic is much more poisonous than that of healthy pregnant women. Ludwig and Savor (1895) submitted additional evidence supporting the theory of autointoxication and at the same time claimed to have observed that after the eclamptic attacks had ceased the urine secreted increased in toxicity. Volhard (1897), Fehling and Schumacher (1901) again proved the fallacy of the urine and serum toxicity. They did not deny the poisonous character of these fluids, but claimed the retained urea, like an allotoxic salt solution, acts destructively upon the red blood-corpuscles and tissues of the body.

Every avenue of research has been attentively pursued to discover the cause of puerperal convulsions. The bacillus, thought to cause eclampsia, was proven harmless. Some experimenters based much upon the assumption that the maternal system was poisoned by the syncytial elements passing from the placenta into the mother's circulation. Others maintained it was not the syncytial elements *per se*, but rather the antibody, syncytiolysin, which poisoned the

organism. Weichardt (1902) sought to prove, experimentally, that it was neither the syncytial elements nor the syncytiolysin, but rather the syncytiotoxin produced by the action of the syncytiolysin upon the syncytial elements, which produced the convulsions. The latest theory (Fischer, 1910) is that of acidosis or decreased alkalinity of the blood.

Interesting and praiseworthy as these efforts are, they, as well as the investigations of many other able observers and experimenters, have revealed naught that was not known fifty years ago, namely, that eclampsia is an autointoxication, the result of a poison or poisons accumulating within the maternal organism due to the imperfect elimination of effete elements. This means an inefficient action of some or of all of the emunctories of the body, but more especially of the kidneys and liver. The character of the poisonous substances is absolutely unknown.

To the practitioner it is of little import whether the convulsions, coma or paralysis observed in the pregnant or lying-in woman are produced by carbamid (an isomer of uric acid), leukomaine, lactic acid, pressure upon the ureters, intraabdominal pressure, thrombi-forming elements supposed to come from the fetus, or by any other factor. What the practitioner wants to know is:

*How is a case of puerperal eclampsia to be treated that the lives of mother and child may be saved?* Not knowing the character of the toxins which cause the convulsions we can only solve this all-important question by looking for an answer in the history—not of the patient—but of the disease.

During the last seventy years, cases of puerperal eclampsia have been studiously observed and carefully recorded, upon the continent of Europe, in England and in this country. Among medical writers no difference of opinion exists as to the symptoms, course, diagnosis or prognosis of this disease. All agree that the disease is sudden in its onset and of short duration; that the number of seizures varies in a single patient from one to more than a hundred; that in some instances one attack may prove fatal, while in other instances complete recovery may occur spontaneously even after numerous convulsions.

In recent years the fatality of the disease, while not apparent to the obstetrician at the time of the convulsions, is realized to have been inevitable when certain conditions are found which can only be learned postmortem; other cases are amenable to rational treatment and quite a number of cases have recovered without medical aid, and, if you please, some of us have seen cases which have recovered

despite the treatment given. You will pardon the reference to the latter class, but let us acknowledge the truth.

All authorities agree that in the majority of cases eclampsia results, primarily, from renal insufficiency. But, as above mentioned, in some cases the puerperal convulsions are due to acute yellow atrophy of the liver alone, or the atrophic condition may be associated with kidney involvement; while in yet other cases the convulsive seizures are due to extravasation of serum or blood into the brain or into the spinal cord.

This explains why some cases are fatal from the onset as acute yellow atrophy of the liver or cerebral apoplexy; and why some cases are amenable to treatment or may recover spontaneously when kidney insufficiency is the only cause. In the latter instance it is due to the fact that the function of the kidney is not so impaired but that it may be reestablished by means of, or, in some cases, without the employment of any remedial agent.

Unfortunately, in eclampsia the diagnosis of acute yellow atrophy of the liver is, probably, never made antemortem, and were we able to diagnosticate this condition at the time of the convulsions, it would avail naught, because, invariably, this disease ends in death. We know no remedy for this variety of puerperal eclampsia, nor for that due to extravasation of serum or blood into the brain. An effusion of blood or serum into the brain or spinal cord cannot be diagnosticated before symptoms of paralysis are manifest and death may even ensue before the diagnosis of apoplexy is possible. If leucin and tyrosin are found in the urine it suggests an acute degenerative process of the liver and the prognosis is correspondingly doubtful. It is an altogether different condition if the kidneys alone are involved. Here, as a rule, the patient after every eclamptic attack recovers consciousness, speech and control of body, and such patients respond promptly to medical treatment.

The fetal mortality in eclampsia depends in large measure upon the period of gestation, and the manner and time of delivery after the onset of the disease. Premature birth, version upon the feet and extraction of the child are frequent causes of the death of the child. Accouchement forcé, formerly so often employed, destroyed the great majority of children and, not infrequently, also the mother. But notwithstanding new methods of treatment, especially vaginal and abdominal hysterotomy and Bossi dilatation, the fetal mortality remains high—30 to 40 per cent. Because all of the remedies employed to combat this malady have failed at some time, and because the death of the child *in utero*, or an early expulsion

of the same has, apparently, favorably influenced the course and termination of the disease, many recent writers and practitioners have concluded that the "*emptying of the uterus*" is the *sine qua non* in the treatment of puerperal convulsions. This, in my opinion, is a grievous error. As shown above, the prognosis depends wholly upon the organs involved and the character and extent of the pathologic lesions.

In 1890 Halbertsma stated before the International Medical Congress at Berlin, that Cesarean section was the only remedy for puerperal eclampsia. Later, the able and brilliant Bumm declared that *emptying of the uterus after the first attack would reduce the maternal mortality to 5 per cent.* Because of this, many operators in this country and in Europe performed vaginal and abdominal hysterotomies indiscriminately and with horrifying frequency. It is the object of this paper to prove such a course of treatment unscientific and unsurgical.

The treatment of eclampsia would be simple, if the conclusions of Halbertsma and of Bumm and their followers were correct. Unfortunately they are not. Bumm himself states that the "prognosis in each individual case depends upon the gravity of the symptoms and that, as a rule, these correspond to the degree of functional disturbance of the kidneys. Severe long-continued attacks, early and profound coma, complete anuria, hemoglobinuria and continued high temperature are unfavorable indications. The case is even more serious if the pulse, strong and full in the beginning, becomes small, soft and very rapid, or when symptoms of incipient edema of the lungs make their appearance. Under such circumstances the termination of labor has a decidedly favorable influence upon the disease. For this reason the convulsions that begin at the last moment of the period of expulsion are less dangerous than those which set in at the beginning of labor or during pregnancy." Bumm also states: "Eclampsia may occur during pregnancy and terminate in recovery without the interruption of gestation; and cases, in which the attacks come on during the puerperium after a perfectly normal labor, may run a relatively unfavorable course. An increased discharge of thin, lightly colored urine is at all times to be greeted as the harbinger of convalescence." And yet, despite these admissions, he concludes that "*prompt delivery after the first attack would reduce the maternal mortality to 5 per cent.*"

A statement such as this, from an authority like Bumm, carries enormous weight and has far-reaching influence upon practitioners and obstetric writers. It also aids in explaining the frequency

with which abdominal, as well as vaginal Cesarean section is to-day performed for the relief of puerperal convulsions.

Reuben Peterson, who has written exhaustively upon the treatment of eclampsia, agrees with Bumm. He says: "Putting an end to pregnancy stops the intoxication since it depends upon pregnancy." McPherson, in speaking of Peterson's statement, naively remarks: "this is a dogma we all wish were true." It is evident McPherson has his doubts and there are others who believe the treatment of puerperal convulsions is a problem not so easily solved. Nevertheless, McPherson accepts Peterson's dogma as a "creed defensible from a pragmatic standpoint." On this continent Peterson and McPherson are the chief advocates of vaginal and abdominal Cesarean section as treatment for puerperal eclampsia. They have a considerable following among surgeons and gynecologists, and there are also a number of obstetricians who are disposed to regard surgery as the most valuable remedial agent in the treatment of puerperal toxemia.

Peterson's admirable address on "A Consideration of Vaginal Cesarean Section in the Treatment of Eclampsia," etc., is perhaps the latest and one of the most exhaustive contributions to the literature of the treatment of eclampsia. The address virtually bristles with facts and figures. It is a splendid proof of his diligence, perseverance and love for the work. His principal object is to prove vaginal Cesarean section worthy of a permanent place in the treatment of eclampsia. As it is my purpose to show that all surgical intervention, no matter of what nature, has accomplished little in the reduction of the mortality of puerperal convulsions, I trust he may pardon my use of his statistics to prove my cause.

Peterson states: "Eclampsia is dependent upon the pregnant state and calls for elimination through various channels, that no one quarrels with such treatment and that it is universally employed." "But when it is proposed that the patient be delivered as soon as the first convulsion has occurred, an argument can be started immediately." He continues: "Since the eclamptic condition arises from pregnancy, it would seem sensible, at least, to conclude that the patient will be relieved by the cessation of pregnancy. Since the real cause of the complication is unknown, the only method at our command for determining the best treatment is by a thorough trial of the different methods of treatment."

This is very true. However, all methods have been tried in a sufficient number of cases to permit of comparison and therefore determine approximately, at least, which method yields the most



satisfactory results. Practice does not in every instance corroborate the teaching of the theorist. This is true in eclampsia, else the convulsions would cease when the uterus is evacuated. But in almost 50 per cent., according to Peterson's Table II, of the cases, the convulsions continue after delivery.

From the time it was recognized that eclampsia is a toxemia (about 1860) to the period when aseptic midwifery was established (about 1880) the eliminative treatment was mainly relied upon. And even before that time, as well as thereafter, many teachers and writers advised us to "treat the convulsions and let the pregnancy alone."

When the prolonged use of chloroform, large and frequent doses of chloral, excessive catharsis, numerous hot baths and hot packs afforded no relief, the case was usually terminated by an accouchement forcé, and the maternal mortality continued between 30 per cent. and 35 per cent. Subsequently careful prophylaxis further reduced the mortality, probably, 5 to 10 per cent. (25 per cent. to 30 per cent. or 20 per cent. to 25 per cent.). So that the average maternal mortality, collectively, prior to the introduction of vaginal and abdominal Cesarean section, decapsulation of the kidneys, deep cervical incisions, etc., was about 28 per cent.

Peterson's first table, giving the results of both the prompt delivery and the expectant plan of treatment of eclampsia, shows a mortality of 15.9 per cent. after prompt delivery in 615 cases, and a mortality of 28.9 per cent. in 390 cases treated on the expectant plan. In his second table, showing the results of immediate delivery and of conservative treatment in eclampsia, we find in immediate delivery of 150 cases the mortality is only 4 per cent., while under the conservative treatment of 147 cases the mortality is 31.2 per cent.

Of the first table Peterson says: These figures "are the more valuable because they show the reduction of mortality in the same clinics through a change in the method of treatment." But Peterson fails to inform us of the character of the "expectant form of treatment" prior to the "change." Of the second table Peterson remarks: "This table probably overestimates the favorable results of immediate delivery in eclampsia." It seems to the writer that the same criticism pertains to Table I, as well as to the striking figures of Fromme (Veit's Clinic), where 100 cases were delivered immediately after entering the clinic; fifty-eight prior to and forty-two after the advent of labor. "Vaginal Cesarean section was performed upon fifty-five of the fifty-eight patients with a mortality of 12 per cent." The manner of immediate delivery in the forty-

two cases is not given; but only two of them died, 4.9 per cent. The total mortality of these 100 cases of eclampsia is thus reduced to 9 per cent. These are astonishing figures. But let us consider.

Peterson's report is very meager as to the character and number of the convulsions in the above series of cases. We wonder what the mortality of these cases would have been with intelligent medical care, such as will be outlined later. Did the so-called expectant treatment in Veit's clinic, preceding the change, consist of large and frequent doses of morphia, chloral, excessive catharsis and chloroform and terminate with forcible dilatation, version and rapid extraction of the child? Before accepting the figures of the first table of our friend Peterson as proof of the value of immediate delivery in eclampsia, we shall at least attempt to show that equally good, if not better, results may be obtained with medical care alone. And it must be stated here that the figures as given in the two tables of Peterson and in those as given by Fromme are the only statistics in which immediate delivery in eclampsia makes any showing at all. A careful consideration of all remaining tables submitted by Peterson and other writers makes a far less favorable impression regarding surgical intervention in puerperal eclampsia.

In Peterson's Table III, modified from Seitz, we find that among a total of 2135 cases of eclampsia, the convulsions continued after operative delivery in 47.3 per cent., and Table IV shows that of 247 cases of eclampsia, the convulsions continued in only 40.5 per cent. Table V contains a total of 994 cases, the convulsions continuing after operative delivery in 40.6 per cent. These figures prove positively that operative delivery does not reduce the tendency of the convulsions to continue after labor. This is a point of great importance.

Again Peterson emphasizes the fact that in those cases where the convulsions ceased after delivery the mortality was only 18.4 per cent., while in the cases where the convulsions continued the mortality numbered 28.4 per cent. This could surprise no one. But, in the latter instance, can we expect a reduction in the mortality from vaginal Cesarean section, or from any operation which does not arrest the convulsion? This is further argument against surgical interference in the treatment of puerperal convulsions.

And then Peterson concludes: "1. The fact that the convulsions cease after delivery does not mean that the patient will recover. 2. On the contrary under these conditions about 18.4 per cent. die. 3. However, it may be said that where the convulsions cease the patient stands a much better chance of recovery, since the mortality is much

higher (10 per cent.) where the convulsions continue after the operation."

Why argue in favor of operative delivery when we have no assurance that the convulsions will cease after the operation? And should they cease, have we any assurance that the patient will recover? Will some one kindly answer these questions?

On the other hand, can one deny that puerperal convulsions have, in a number of cases, ceased before labor, with and without treatment, and the pregnancy continued to the end, terminating spontaneously and favorably for both mother and child? Can any one deny that women in labor have had numerous eclamptic attacks and then delivered themselves of a living child and made a splendid recovery?

Table VII (Peterson) "shows the increase in the maternal mortality with the increase in the number of attacks." Let me ask: Does surgery stay the eclamptic seizures? Have we no less formidable and more reliable measures for the relief of eclampsia?

In Table VIII (Peterson) we observe that in the vaginal Cesarean section immediately after the first convulsion, in twenty-seven cases the mortality is 18.51 per cent.; immediately after the fifth convulsion, in forty cases the mortality is only 15 per cent.; immediately after the ninth convulsion in fourteen cases, the mortality is only 7.14 per cent.; and immediately after the eleventh to the sixty-fifth convulsion in sixty-nine cases it is 43.48 per cent.

Thus Peterson concludes: "1. The mortality in eclampsia after vaginal Cesarean section increases with the increase in the number of convulsions preceding the operation. 2. Up to ten convulsions there is no "*particular regularity*" to the mortality of eclampsia when the uterus is emptied by vaginal Cesarean section. 3. However, beginning with the operations performed after ten convulsions, the mortality rapidly increases until it reaches a high figure."

It would seem Dr. Peterson was loth to acknowledge the fact that the mortality was less after the fifth and ninth convulsion (15 per cent. and 7.14 per cent. respectively) than in operations performed after the first convulsion. He dismisses these figures as of "no particular regularity." Table VIII supports the opinion reiterated, time and again, that the gravity of the prognosis of eclampsia increases with every attack up to the fifteenth or the twenty-fifth seizure, and, that thereafter the danger diminishes in quite a number of cases.

McPherson states, all cases considered, that eclampsia has yet an average mortality of 28.9 per cent.; that the mortality is re-

duced 10 per cent. when there are no postpartum convulsions, and that after ten antepartum convulsions the mortality greatly increases. It has just been shown that this is by no means invariably true.

McPherson's assertion that "*no physician can save life, where the intoxication has extended to the kidney, liver and brain of the mother with such serious degenerative changes as often occur before the first convulsion,*" must also be challenged. The experience of many of my colleagues, as well as my own, does not support this extravagant statement. It is so glaringly out of harmony with the history of this disease, that he who is familiar with its history and has had extensive experience with eclamptic cases, can but at once reject this assertion as untenable.

The writer entertains the highest personal regard for Drs. Peterson and McPherson. He also has most profound admiration for those able teachers and effective writers Halbertsma and Bumm, indeed, for all who may be quoted hereafter. But when these gentlemen and their many followers assert that *immediate emptying of the pregnant uterus is the best and only rational treatment for puerperal convulsions and that this treatment, more than any other, has reduced the mortality of this disease*, the writer, because of his personal experience, is compelled to differ from them and will give evidence that he who advocates immediate delivery in every case of eclampsia, errs.

Peterson collected reports of 530 cases of vaginal Cesarean section for eclampsia from 100 operators in twelve different countries, and found, "*in operations immediately after the first eclamptic seizure,*" that the maternal mortality was as low as 18.51 per cent. In that twenty eclamptic cases reported by McPherson the maternal mortality was considerably higher, 25 per cent. Comparing the results of these investigators we find "*in operations performed immediately after the first eclamptic seizure*", the maternal mortality was 21.75 per cent.

Bumm predicted that under "immediate delivery, the maternal mortality of eclampsia could be reduced to 5 per cent." How must our distinguished confrère of Berlin feel when he reads Peterson's and McPherson's articles and finds that under the treatment recommended by him, the average maternal mortality, instead of dropping to 5 per cent., is 21.75 per cent., or 1.75 per cent. higher than the average maternal mortality obtained under the various modes of treatment employed at present and without hysterotomy?

If we add to the above the thirteen cases of Cesarean section for eclampsia, performed by A. B. Davis, in which nine mothers lived

and four died (30.76 per cent.) the collective maternal mortality of eclampsia with vaginal and abdominal Cesarean section is at once increased to 29.3 per cent. The writer does not censure the operators for the unfavorable results; he simply desires to substantiate the claim that surgical intervention alone, whether by Cesarean section or by any other operation, is not to be depended upon for the relief of eclampsia.

Dr. J. F. Moran, of Washington, D. C., reports four successful cases of Cesarean section for eclampsia. The first patient, a primipara, had had two convulsions. With the hope of saving both mother and child Cesarean section was performed to the exclusion of any other treatment. The mother lived, but the child died six weeks after birth. The second, third and fourth operations were performed upon the same patient. Number of convulsions not stated. No other previous treatment. The mothers and all children lived.

The management of these four cases of puerperal eclampsia clearly shows the tendency toward the surgical treatment of these cases and an utter disregard for medical care. Do these four successful Cesarean sections of Moran prove that in each instance recovery would not have taken place without operation? And that medical care is of no value? If this were true, it should be asserted, because Cesarean section is now being performed, by some operators, an hundred times or more, with success, that all women should be delivered in this manner and thus mothers be saved many hours of suffering and accidents and complications, apt to follow a normal labor.

What do Moran's cases prove? That in a clean case, Cesarean section is, usually, followed by good results. Nothing more. It does not mean that surgery cures convulsions. It does not mean that these four cases of eclampsia could not have been successfully treated medically. It does not even mean that these patients might not have recovered without any treatment. Have not many of these unfortunate patients even after numerous convulsions delivered themselves spontaneously with, or without, medical care and wholly recovered?

Moran, to justify the four Cesarean sections reported by him, refers to Kellitz, who collected twenty-eight cases of Cesarean section for eclampsia with a maternal mortality of 50 per cent. and a fetal mortality of 62 per cent. Moran further cites Streckhausen who also collected twenty-eight cases of Cesarean section for eclampsia with a maternal mortality of 48.8 per cent. and a fetal mortality

of 31 per cent. He then speaks of Hillmann's seven cases, not included in the list of Kellitz and Streckhausen. Of these seven cases, five mothers died, 71 per cent.

Moran himself reports fifty-three collected cases of Cesarean section for eclampsia from 1901 to 1911. This list reveals a maternal mortality of 32.32 per cent. yet, notwithstanding this, he says: "Altogether 116 cases have been recorded in the literature, with a maternal mortality of 48.93 per cent. and of infants 39 per cent. respectively," or more than double the usual maternal death rate of eclampsia. Moran admits that "this is not convincing argument," because many of the patients were moribund before the operation. "Yet," he finds "that the results during the last decade are very encouraging, and that the death rate of the mothers has been reduced to 32.32 per cent.; 19.9 per cent. for the infants." And then he adds: "This steady improvement in the statistics has been due, in great measure, to better technic, greater care in selection of cases, and prompt intervention." And with all this painstaking care, skill and experience the maternal mortality remains at 32.32 per cent. and the fetal mortality at 19.9 per cent. If this is advancement, the writer fails to appreciate it.

Is not the above convincing evidence that the dictum, "*empty the uterus in all cases of puerperal eclampsia immediately after the first attack*" is wrong? And when have we observed that "*frequently*" after the first convulsion, we find the "*kidney, liver and brain of the mother seriously degenerated?*" Is not this the exception rather than the rule? My own experience with eclampsia does not vary essentially from that of other observers. In the great majority of my cases, the first seizure did not leave the patient at all seriously affected. Indeed, when I was a young practitioner, I saw two cases in which from three to five convulsions occurred in from five to eight hours, and in each instance, when my consultant arrived he found the patient so comfortable and cheerful that he doubted my diagnosis and deliberately awaited another seizure before beginning treatment. This is by no means a relatively unusual experience.

*Suppose, gentlemen, all obstetricians should decide to interfere surgically in every case of eclampsia, immediately after the first seizure, antepartum, before complete dilatation of the os, or even before it is sufficiently dilated for the application of forceps, or the introduction of the hand for the purpose of version; and if, after giving this treatment a fair trial, we would still record a maternal mortality of 20 per cent. to 29 per cent., would we not be compelled to confess that in at*



least 70 per cent. to 80 per cent. of all cases, the operation was unnecessarily performed? If there is any one who can prove this conclusion wrong or unfair, it is his duty to come forward and present his evidence.

*Except in the presence of some deformity or disease within the pelvis, or in those cases in which it is necessary to overcome some obstruction, or to save the child, surgery has contributed nothing to the reduction of the maternal mortality in eclampsia.* The sole object of surgery under these conditions is to save the child, to make labor as easy as possible for the mother and to protect the parturient canal from injury. The value of surgical intervention alone as a curative measure in the treatment of eclampsia cannot be granted. That surgery assists in an early and sometimes favorable termination of the case, cannot be refuted any more than it can be positively asserted that it cuts short the progress of the disease.

The dogma that in all cases of puerperal eclampsia occurring during pregnancy or in the presence of an undilated os during labor, vaginal or abdominal Cesarean section is the most rational and best treatment has, in the opinion of the writer, a very weak foundation. That, under certain definite conditions, Cesarean section is the proper treatment for this disease is conceded. But nothing is more illogical or misleading than to assert that immediate interruption of gestation is the only proper mode of treatment in every case of puerperal convulsions.

*The absolute disregard for medical treatment in these cases is as flagrant as is the advocacy of surgical intervention as the only measure for relief.* He who denies the efficacy of medicine in the treatment of eclampsia simply betrays a lack of knowledge and experience in which a competent surgeon should not be wanting. In the management of puerperal convulsions much more good is to be obtained through intelligent medical care than some are willing to acknowledge. Usually it is those who do not know how, why or when to administer medicine who decry the use of drugs.

The treatment of puerperal eclampsia is still empirical in character owing to the fact that we have not been able to determine the character of the toxin or toxins which are responsible for the convulsions and notwithstanding our knowledge that poison or poisons result from an impaired function of the excretories of the body, especially of the kidneys. For this reason nearly forty years of experience with eclampsia and its varied treatment should be of some value and entitle the writer to a respectful hearing.

Two years ago a brief analysis of ninety cases of puerperal eclamp-

sia and a critical review of the treatment of this disease was presented by the writer to the American Association of Obstetricians and Gynecologists at Syracuse, N. Y. In that paper indubitable proof was offered that correct medical treatment saved the lives of more mothers than were saved by surgical means. My series of the twenty-six cases, then reported as having received medical treatment almost exclusively, with a maternal mortality of only 15.38 per cent. and a fetal mortality of 53.88 per cent., has since then increased by four cases in which the treatment was limited, absolutely, to the use of veratrum viridi (hypodermatically), hot baths, gentle catharsis and strict milk diet. In these four cases all mothers recovered and the children, born spontaneously, lived. This reduced the maternal mortality of my last thirty cases to 13.3 per cent. and the fetal mortality to 46.6 per cent.

Ballantyne reported twenty-nine cases of puerperal eclampsia with five deaths, a maternal mortality of 17.2 per cent. His fetal mortality was not stated. These cases extended over a period of five years. Early in his career he was inclined to interrupt pregnancy by employing Bossi dilatation, deep cervical incisions, forceps, lumbar puncture, venesection, hot packs, purgatives, thyroid extract, bromides, chloral, morphia or chloroform. In all cases in which he interfered with gestation, even in the early stage of labor, the results were disappointing, for the majority of the patients died. He therefore decided to disregard the pregnancy and to treat the convulsions. Of his last seventeen cases but two mothers were lost, 11.66 per cent. He consequently stated "*I am left more disposed to medical treatment and less inclined to force labor.*" Fern reports ten cases of puerperal convulsions treated with large doses of veratrum viridi with a maternal mortality of 10 per cent. Rushmore collected eighty-eight cases of eclampsia treated with varying doses of veratrum viridi, chloroform and morphia, showing a maternal mortality of 20.45 per cent. Stroganoff reports a series of 400 cases of eclampsia treated, principally, with large doses of morphia with a maternal mortality of only 6.6 per cent. Thus the collective maternal mortality of the medical care of eclampsia of these five authors is only 12 per cent.

Referring to Peterson's 530 collected cases of vaginal Cesarean section, McPherson states that in operations performed immediately after the first eclamptic seizure, the mortality is as low as 18.51 per cent. Referring to his own twenty eclamptic cases, he reports a maternal mortality of 25 per cent. However, after deducting one case in which the child showed no life before the operation, his fetal

mortality showed a very low average, 10 per cent. A. B. Davis reports thirteen Cesarean sections for eclampsia with four maternal deaths, 30.76 per cent.

It is generally admitted that forcible dilatation of the uterus, whether metal, manual, or balloon, does not benefit the mother, and that this mode of treatment often paves the way for fatal septic infection.

For the relief and cure of eclampsia as much, and indeed more, has been claimed for decapsulation of the kidneys, than for early vaginal or abdominal Cesarean section.

For the sake of comparison permit me to quote W. Poten who from various sources collected reports of 102 cases of kidney decapsulation. He excludes from this list four cases: one each of Edebohls, Ganns, Pieri, and Sippel, because, in the case of the first three mentioned, the operation was performed before labor and in the case of Sippel on but one kidney.

To correctly judge the results obtained in the other ninety-eight cases, he presents the following table:

No attacks after decapsulation	42 times with	15 deaths
1 to 6 attacks after decapsulation	27 times with	10 deaths
7 to 10 attacks after decapsulation	4 times with	3 deaths
11 and more attacks after decapsulation	4 times with	0 deaths
Indef. num. attacks after decapsulation	21 times with	10 deaths

Total of	98 operations	38 mat. mort. = 37.76 per cent.
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Thus we find in the surgical treatment of eclampsia as shown by the above and by the preceding figures:

With decapsulation of kidneys (Poten) . . .	Mat. mort. 37.76 per cent.
With Cesarean section (Peterson, Davis McPherson, Halbertsma, Kellitz, Streck- hausen and Moran) . . . . .	Mat. mort. 27.00 per cent.
With strictly medical care (Ballantyne, Fern, Rushmore, Stroganoff and Zinke. . .	Mat. mort. 12.00 per cent.

These figures speak for themselves. But as further evidence of the insufficiency of surgery in the treatment of puerperal convulsions we present the following table, the most striking of all, also taken from Poten:

#### DECAPSULATION

After 4 to 6 attacks . . . . .	15 with	2 deaths	13.3 per cent.
After 7 to 10 attacks . . . . .	23 with	10 deaths	43.5 per cent.
After 11 and more attacks . . . . .	43 with	21 deaths	48.8 per cent.

Total of	81 cases	33 deaths	40.7 per cent.
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## NO DECAPSULATION

After 4 to 6 attacks.....	35 with	4 deaths 11.4 per cent.
After 7 to 10 attacks.....	28 with	5 deaths 17.8 per cent.
After 11 and more attacks.....	27 with	12 deaths 44.4 per cent.

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Total of..... 90 cases 21 deaths 23.3 per cent.

He who will carefully examine the above tables must conclude that surgery has contributed little, indeed almost nothing, to the reduction of the maternal mortality from puerperal eclampsia. "*Assist labor, but do not induce it*" or "*treat the convulsions and let pregnancy take care of itself*" is still good teaching.

Decapsulation of the kidneys assuredly has no place in the treatment of puerperal convulsions. If the patient is at term, but not in labor, and medical care fails in prompt amelioration of her condition, then Cesarean section may be admissible. Or if, under the same circumstances, the patient is just within the period of viability, vaginal hysterotomy may be the proper method of procedure. Prior to the end of the twenty-eighth week of gestation deep cervical incisions will readily serve to empty the uterus.

Too great reliance, however, must not be placed upon surgical operations. Many of the fatal cases are not reported and, if the whole truth were known, the maternal mortality after these operations, performed for the relief of eclampsia, would probably exceed 35 per cent. Under certain conditions, viz., to save the life of the child, abdominal hysterotomy may be justifiable. But we shall always bear in mind that the Cesarean section is and will ever be a formidable operation. At the fifth International Congress at St. Petersburg, Amond Routh reported seven cases of Cesarean section for the relief of puerperal eclampsia. Four of the mothers died, 57 per cent. Think of it!

While in an aseptic case in the hands of a skilled surgeon, vaginal and abdominal hysterotomy may be a comparatively safe operation, it is impossible, in its thorough consideration, to exclude two facts: one, that from 75 to 80 per cent. of all eclamptic cases recover without operation; the other, that from none of these cases can the element of sepsis be wholly excluded.

Abdominal Cesarean section means that both the peritoneal and uterine cavities must be widely opened; that suturing of each wound is necessarily slow, because of the care necessary to make perfect coaptation of the wound; that there is often great loss of blood; that saprophytes if present within the uterine cavity, are sufficient to prevent union and may possibly cause fatal peritonitis. If during the operation virulent streptococci have found their way

into the uterus, or if germs have passed directly through the thin layer of peritoneum covering the vesico-uterine space, the result may be fatal because of a progressive phlegmonous pelvic cellulitis or a septic thrombophlebitis. These are some of the grave dangers of abdominal hysterotomy. Bumm has repeatedly referred to, and dwelt with emphasis upon all of these dangers as being attendant upon this operation. Nevertheless, he and his followers advocate Cesarean section in some cases after the first eclamptic attack. Is this consistent? Do the results of this or any other severe surgical operation when performed for eclampsia, support the doctrine of Halbertsma, Bumm and others that *the immediate emptying of the uterus in puerperal convulsions is the best and only treatment*? There can be but one answer: *No! Unreservedly no!*

Judicious medical care therefore remains our chief reliance in the treatment of puerperal eclampsia. To be successful, earnest determination and intelligent action must direct the management of these cases. Nothing can be more injurious, and therefore culpable, than the giving of first one and then another medicine, thereby in a short time overwhelming the patient with a number of drugs in the hope that if one fails another may give relief.

The treatment of puerperal eclampsia is comparatively simple:

(1) *The Prophylactic Treatment of Eclampsia* is divided into

(a) *Prophylaxis*, which consists of the intelligent management of the pregnant state, is indicated in every case of pregnancy before the appearance of any symptoms. This implies that all emunctories of the body must be kept in the best possible condition. There must be invariably clean skin, regular intestinal evacuations, and especial care given the functions of the liver and kidneys; careful observation of the patient's surroundings, of her diet, dress; of daily judicious exercise in the open air; of sufficient rest and sleep.

(b) *Prophylaxis after the Appearance of Symptoms*.—In the presence of a well-marked edema, anemia, hydremia, with or without albumin in the urine, severe and oft-recurring headaches, dimness or difficulty of vision, dizziness, tinnitus aurium, general indisposition, restlessness, insomnia, or irritability of temper, a definite and persistent plan of treatment must be adopted for the relief of any or all of these symptoms. If the symptoms be few and mild, the strict observance of the ordinary rules of the hygiene of pregnancy may suffice in many cases. If, notwithstanding the strict observance of the well-established rules for the management of a normal pregnancy, or in cases where no rules were observed, prodromal symptoms should become manifest, then a more vigorous plan of

treatment is indicated. The following course is endorsed by the best authorities.

*Milk diet* should be strict and absolute from the start. Milk diet leaves no residue in the intestinal tract. Water may be given ad libitum. As the patient's condition improves, broths with tapioca, sago, rice and toast may be added to the diet.

*Catharsis* must be prompt, free and regular every day. The means to obtain this must necessarily vary according to the habit and general health of the patient. Winckel's pill of aloes and colocynth, with or without calomel, taken at bedtime and followed by a saline draught in the morning is an excellent combination. In cases of severe constipation, calomel or compound jalap (singly or combined) may be given at night in full doses, to be followed in the morning by one of the stronger sulphur waters (viz. Rubinat). Excessive catharsis should at all times be avoided. When the liver is involved, calomel combined with bicarbonate of soda is perhaps the best agent to evacuate the bowels. In the presence of well-marked prodromal symptoms or an impending attack of convulsions, 5 grains of calomel combined with 10 or 15 grains of compound jalap, may be administered. Chronic constipation is a frequent and annoying complication. Much will depend upon the physician's skill in combating this condition. To overcome the constipation, Edgar advises a tablet composed of calomel, digitalis, squills  $\text{ãã}$  gr. 1, and muriate of pilocarpine gr. 1/20 to be taken at bedtime and followed the next morning by a full dose of Villacabra water.

*Hot baths* daily for a few days in some cases, and two or three times a week in other cases, are the best agents for rendering the skin clean and active; and when these are accompanied by large draughts of hot water, light tea or milk, the activity of the kidneys is very favorably influenced. The hot pack or hot-air bath may be substituted for the hot-water bath in the absence of a bath-tub. It must be forgotten that these measures may cause abortion or precipitate labor, but either event may be desirable. Immediately after the hot bath or hot pack, the action of the skin may be increased by gentle massage and be maintained by the wearing of woolen underwear.

*Fresh air, and abundance of fresh water, gentle exercise, calisthenics and massage* are conducive to the rapid elimination of effete matter. If the condition of the patient precludes outdoor exercise, the best substitute is free ventilation of the room, moderate exercise with calisthenics and massage.

*Dress* must be suitable to the season and climate and should be



arranged to permit perfect freedom of respiration and motion. Woolen underwear should be insisted upon, especially in cold weather, and it will greatly benefit the patient if light woollens are worn during warm weather.

*Sleep and rest in bed* are absolutely essential if the patient is weak and the extremities edematous. Sleep is most effectually induced by small and, if necessary, oft repeated doses of chloralhydrate per os or per rectum. From 5 to 10 grains well diluted may be given by mouth every half hour or every hour until sleep is induced. If the stomach is irritable, double or treble the above amount may as often be thrown into the rectum. In moderate doses this drug may be administered daily throughout a long period without deleterious effect on mother or child. If there is anemia or hydremia, a suitable iron preparation may be employed.

(2) *The Curative Treatment of Eclampsia.*

In the beginning of this paper I have spoken of three distinct varieties of puerperal eclampsia. They have been termed *the malignant variety*, which does not yield to any treatment; *the benign variety*, in which recovery may take place spontaneously; *the variety of mean gravity*, in which both course and cure are favorably influenced by careful and judicious treatment.

*To control or abbreviate the convulsions*, hypodermic injections of veratrum viridi, 15 minims (or twenty-five drops) and, sometimes, in connection with it the administration of large doses of chloral per rectum, have been favorite remedies with me during the last ten years.

Recently, *bleeding* has been reintroduced and is regarded favorably by some of our best authors. Fordyce Barker's indication for bleeding: "*When the attack occurs before labor, if the pulse be strong and hard with fullness of the vascular system, and when the appearance of the face indicates vascular congestion, bleed at once*," as a guide for bleeding, is as true to-day as ever before. Copious bleeding is always contraindicated.

*Chloroform* by inhalation during the attack is questionable practice. Some practitioners have discarded it altogether, as its prolonged use may induce fatty degeneration of the heart or impairment of the function of the kidney and liver. (Kaltenbach, Dührssen, Runge and others). Ballin reports nine postoperative cases of acute yellow atrophy following chloroform narcosis.

The administration of large doses of *morphia*, consisting of 1 to 1 1/2 grains to be repeated if the convulsions recur, as recommended by Dr. Clark of Oswego, N. Y., and by Profs. Veit and Stroganoff,

is to be deprecated. My own experience with this drug does not correspond with the results obtained by these writers. Morphine in large doses prolongs the post eclamptic stupor and "increases the tendency to death during coma by its interference with the eliminative process" and because of this, many obstetricians, including myself, have discarded it.

*Chloral hydrate* is more in favor abroad, especially in France and Germany, than in this country. When given to control convulsions, it has always been a disappointment to me. From 20 to 40 grains may be introduced into the rectum at intervals of from one to two hours. Even more than 180 grains has been given during twenty-four hours without ill effect. Chloral, like *veratrum viridi*, lessens arterial tension and when suspended in mucilage is best tolerated in the bowel. Veit within one month, and with good results, gave to a young primipara 120 grams (1,800 grains) of chloral hydrate.

The use of *normal saline solution*, in moderate quantity under the skin and copiously per rectum, is a splendid aid in conjunction with other means. Fischer's solution (1.4 per cent. chloride of sodium and 2 per cent. of crystalized carbonate of sodium) intravenously or per rectum, is very valuable.

The value of the *extracts of the thyroid and parathyroid glands* for the treatment of eclampsia as recommended by Nicholson and endorsed by Bacon of Chicago, Davis of Philadelphia and others, awaits further demonstration. Nicholson claims they destroy the metabolic and other poisons, and that they are efficient diuretics and nutritive stimulants.

*The withdrawal of cerebrospinal fluid by lumbar puncture* (Helme and Koenig) for the relief of intracranial pressure, is a hazardous and doubtful procedure.

*Oxygen inhalation* is of value during and between convulsions because of the danger of asphyxiation from impeded respiration. It stimulates the weakened heart, and is an excellent remedy for slow breathing resulting from prolonged anesthesia.

In 1903, as recommended by Baker, Fordyce Barker, Reamy and Jewett, I began to use freely the tincture of *veratrum viridi* and since have gradually formulated the following definite plan of treatment for eclampsia. Whenever the condition of the patient and her environment permit, it is carried out in the order mentioned.

(1) If the patient has, or has had, convulsive seizures, twenty-five drops, or fifteen minims (1 c.c.) of Norwood's tincture of *veratrum viridi* (especially prepared and kept for this purpose) are given hypodermically, and this dosage is repeated every hour until the

pulse is reduced to 60 per minute or less. If within an hour the pulse should fall from 150 to 100 per minute, only ten drops of the veratrum are to be injected in the succeeding dose, no matter whether this be the second, third or fourth hypodermic. More than two or three full doses are rarely necessary to bring the pulse to 60. Veratrum viridi thus administered is the most valuable remedy in the treatment of eclampsia.

(2) A copious enema of soap water serves to wash out the large intestine. The catheter is employed to empty the bladder; the urine is measured to learn the secretory power of the kidneys, then the urine is examined. As soon as the patient is able to swallow, a tablespoonful of Epsom salts, or some other saline cathartic, is administered per mouth. Stronger cathartics are only given when the saline proves ineffectual. (By this time, if the patient is not in a hospital, she should, if possible, be taken to one.)

(3) Whether the patient is in a hospital or not, immediately after the above treatment has been administered, she is given a hot bath or hot pack, preferably the former. Neither the bath nor pack exceeds a half-hour in duration. The patient is then rubbed dry and placed in a warm, dry bed. The bath or pack is given not oftener than twice in one day. Ordinarily, but one bath or pack is necessary in twenty-four hours.

(4) The only food permitted is milk or broth, or both. Water or Fischer's solution may be freely administered. The latter may be given per rectum or, if the case be an urgent one, intravenously.

(5) Chloral per os or rectum is given if the patient is very restless. Of late I have discarded the use of chloroform and morphia; ether or gas-ether is the anesthetic if operative measures must be employed.

(6) If the patient is at the end of the first stage of labor, and then only if the symptoms are grave, may forceps be employed to terminate labor. If the first stage is not complete or if labor has not begun and the patient has improved under the treatment above mentioned, the case is then left to nature until the first stage of labor is completed, when forceps may be applied.

(7) In cases of anemia, or asthenia from any cause, the normal saline solution or Fischer's solution is given, per rectum or intravenously.

With very little variation this has been my plan of treatment for the last ten years, during which time thirty cases of eclampsia were observed. Four mothers, 13.3 per cent., died. Fifteen or 50 per cent. of the children were lost.

The still high maternal mortality, 13.3 per cent., and fetal mor-

tality, 50 per cent., in my last thirty cases, is due to the fact that two of the mothers were moribund when first seen by me; one remained in profound coma after the first, another after the eleventh convulsion. The third died of shock and hemorrhage following an accouchement forcé performed by the doctor in charge of the case. The fourth died soon after the eleventh convulsion and a comparatively easy vaginal hysterotomy performed without an anesthetic.

It is not claimed that the above mode of procedure will be invariably successful; but my experience impels me to believe that in those cases in which it fails, very little could have been expected from surgical intervention. Certainly in the presence of any condition (maternal or fetal) which makes the birth of the child *per via naturalis* hazardous or impossible, abdominal or vaginal Cesarean section or deep cervical incisions, each depending upon the period of gestation and other circumstances, are justifiable operations. But in view of the evidence presented, *it can but prove a serious error to maintain that an immediate interruption of gestation or termination of labor, by any surgical method in vogue, is the treatment par excellence in eclampsia.* The good results obtained from strictly medical care in these cases far exceed the results accruing from all the surgical means proposed for relief from this disease.

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## CURRENT OPINIONS CONCERNING THE TOXEMIA OF PREGNANCY.

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At the outset let it be said that this paper makes no claims to originality, but was written in an endeavor to gain, from among the many mysteries surrounding the toxemia of pregnancy, some definite and clear ideas to employ in treating such cases as arise in an active obstetrical service. I have borrowed freely from various sources, though what to accept and reject has at times been bewildering as anyone can bear witness, who has attempted to review the literature of the past few years.

<sup>1</sup> Read before the Brooklyn Gynecological Society December, 1911, 1912.

The remark recently made by a member of this society that pregnancy should be regarded in most instance as a pathological state, and the pregnant woman possessed of a tumor, which is removed by delivery rather than by the usual operation, may not have been intended entirely in serious vein, but it illustrates well the attitude the profession and the laity, too, are very slowly assuming toward the matter of pregnancy. It is no longer the part of the obstetrician to be present merely at the parturition, but to guide the patient through a nine months' pregnancy in such a manner that she will be strong for the supreme ordeal, and come through, not only with her life, but in nearly the full health she possessed before pregnancy began (Pomeroy); this in itself is no mean task. That the men in general practice are beginning to appreciate the dire possibilities of pregnancy is shown by the greater number of cases on which they seek opinions as to the advisability of allowing certain patients to assume the responsibility of pregnancy, and the large number of patients who are referred for treatment or opinion about early abnormalities. That the laity are slowly waking up is shown by the increased number who voluntarily place themselves in the hands of their medical advisers very early and who, without request, bring the customary bottle of urine. It is not an uncommon thing nowadays for a patient to seek as competent obstetrical help as she would surgical help, even though in other matters medical she consult the general family adviser.

We are fond of referring to the squaw as an example of the physiological character of pregnancy and parturition. She is supposed to have dropped back a little from the caravan, retreated to the bushes for the birth act, washed her babe in the nearest stream and shortly to have rejoined the procession. Ewing remarks, however, "History is silent about the women who never caught up with the procession."

Surely if an abnormal condition such as the fatty infiltration and degeneration of the kidney be found, without symptoms, so common in pregnancy as to be called by Von Leyden "the kidney of pregnancy," the pregnant state is hardly physiological. There is a disposition as well to liver changes.

If we accept the teaching of Ewing and Edgar that the minor ills of gestation, such as morning nausea and vomiting, and the trivial aches and pains that we have believed to be part of a normal pregnancy—if these are possibly the expression of a mild toxemia, how few are physiological.

The truth of the matter is that pregnancy is a border-line condi-



tion and while the majority of cases seem to follow a physiological course, there is an increasing number of pathological gestations; in any event, the predisposition to trouble requires the addition of seemingly minor deviations to produce serious consequences.

Coming to the *toxemias*, there is still no unanimity of opinion as to their identity. Edgar and Ewing still claim that pernicious vomiting of pregnancy, acute yellow atrophy, albuminuria or preeclampsia, and eclampsia are but different phases of disturbed metabolism and in this contention they are supported by some of the French writers. Williams, on the other hand, maintains his position that there are distinct differences in these conditions and points to the opposite pathological findings in the liver in pernicious vomiting and eclampsia. He has receded somewhat, however, from a former stand in admitting that there is a toxic element in all pernicious vomiting, and does not rigidly classify such vomiting as formerly, as reflex, neurotic, and toxic. With equally good observers taking opposite views there remains much work to be done in this very important subject and for the present, whether we hold to one or the other view, we are compelled to take our stand on the broad and somewhat indefinite term, but upon which we can all unite, disturbed metabolism.

*What of Etiology?*—A discussion of all the various causes of toxemia would be tiring, for when Zweifel called eclampsia "the disease of theories" he might have easily broadened his definition to include all the forms of toxemia. Every organ, almost, has been held responsible.

I shall refer only to those theories which confirmed research has shown valuable.

*Predisposing Causes.*—A family history of disturbed metabolism may predict trouble even in advance of pregnancy. Thus in the case reported recently by Dr. Victor Robertson, before the Brooklyn Pathological Society, the father is gouty, and two other members have diabetes mellitus, the patient herself having had pernicious vomiting in two successive pregnancies. From what has previously been said about pregnancy being a border-line condition, gestation must be regarded also as predisposing to toxemia.

*Exciting Causes.*—We are still obliged to confess ignorance of any definite and constant etiological factor.

While the theories about to be mentioned apply more especially to eclampsia, if we accept the teaching that eclampsia has almost always been preceded by a period of latent symptoms, or even that the eclamptic seizures are but the evidence of earlier toxemia, then

these theories may apply equally as well to the earlier symptoms. The pernicious vomiting safely passed does predispose to later additional appearances of the same toxemia.

*First the Theory of Fetal Origin.*—It is believed that the inability of the mother to eliminate the products of the independent fetal metabolism, and the failing under the accumulation of these toxic wastes, produces the toxemia. In children dying of convulsions soon after birth, the occurrences of changes in fetal liver and kidneys identical with those of parent help out this theory and the objection, that eclampsia has occurred in ectopic and hydatiform gestation, can be met by the possibility of identity of fetal metabolism and growth of chorionic epithelium. On the other hand, the death or delivery of the fetus checking maternal convulsions may mean, simply, that coincident elimination on the part of the mother has begun, and not that the fetus as a cause has been removed. In fact, Lichtenstein says that recent reviews of the literature show that very few cases of convulsions ceased after fetal death; rather oftener he found that the convulsions developed first after fetal death. Twenty-eight per cent. of the women who died had been delivered of macerated children. Improvement after death of fetus means that the treatment in addition to, and not because of, killing the fetus has aided the patient; further improvement postpartum means not that it is due so much to emptying the uterus as the loss of a large amount of toxin laden blood.

*The theory of anaphylaxis* to syncytio-toxin in the circulating blood is interesting but the work done so far is contradictory, as may be said, also, of the theory of deportation of chorionic villi or syncytial cells, for the latter have been found quite generally in the organs of women dead of other diseases.

The injection of emulsions of *placenta* or placental extracts has produced changes and convulsions differing little from those of true eclampsia and the workers in this field were sanguine that the solution of the problem was at hand until later researches showed that the same extracts and emulsions were harmless if freed from suspended particles. Perversion of the normally rich placental ferments has been asserted to be the cause of toxemia, but Frank has only recently said that after considerable work he believes the placenta to be probably only a passive organ for exchange rather than an active organ of metabolism.

The absence of the usual enlargement of the *thyroid* in pregnancy is suggested as a cause. The administration of small doses of thyroid extract throughout pregnancy has produced healthy babes after

several disasters. It has been shown also that thyroid extract, not itself a nutrient, not only corrects the acidosis of toxemia but relieves the symptoms by aiding nitrogen metabolism. Ward, whose work in this field entitles him to a hearing, says that with the ammonia-converting or destroying power of the liver inhibited by thyroidectomy, ammonia appears in the liver and blood as an evidence of disturbed metabolism. When the nitrogen partition shows high ammonia output thyroid administration is indicated. Sajous, whose work in ductless glands and internal secretions is famous, says that the thyroid and parathyroids produce antibodies or opsonins to take care of maternal and fetal wastes found in the blood and thereby serve to protect the maternal organism from harm. The failure of the thyroid and parathyroids to aid allows the toxic wastes to form and these prove very irritating to the kidney, causing albuminuria, and favoring and predisposing to eclampsia. Certainly these organs so concerned in metabolism generally have some influence in pregnancy and toxemia.

*The liver* has been regarded for over fifty years as the probable seat of disease in several of the severe and fatal disorders of pregnancy, and to-day the liver of pregnancy must be recognized. In so-called normal pregnancies it often shows mild grades of those lesions which appear in pronounced form in fatal cases. The changes are anemic and hemorrhagic necroses in the liver substance, degeneration of cells in portal spaces at periphery of lobule with formation of fibrin.

*The kidney* of pregnancy has been referred to and this, under the influence of disturbed metabolism, may go on to active parenchymatous degeneration affecting principally the epithelium of the convoluted tubules, though even there the changes may be slight. These changes are apart and separate from those occurring in an active nephritis existing prior to pregnancy, increasing in that state, and producing at the worst, not eclampsia but uremic convulsions. This type of case, while due to pregnancy is not the true toxemic type; it fails to clear up after delivery, the pressure is not so high and the nitrogen partition is not of so great value.

*The breasts* have even been held responsible for the toxic state, more especially the eclamptic seizures, based principally on the analogy between eclampsia and parturient paresis in the cow, in which latter, the colostrum has produced death in guinea-pigs with the same pathological degenerations found in eclampsia. Knowing that arsenic and morphine are excreted ten times stronger in the milk than in the urine, the facts are probably that in the human at least

instead of being the point of origin of the toxin the breasts are merely excretory for a highly concentrated portion of the generally distributed toxins. In Harrar's case, the colostrum from eclampsia failed to kill the guinea-pig, and when later killed no pathological changes were found.

The noted instability of the nervous system in pregnancy accentuates all symptoms of toxemia and while the changes are mainly functional it must be recognized as a factor and not merely a neurotic element.

The theories of lactic acid in the blood, and deficient calcium salts are merely mentioned.

The pathology, in addition to what has been said, shows a degeneration of myocardium; the brain shows edema, hyperemia and apoplexies, but the liver presents the only constant and characteristic changes.

Any classification of toxemia on the basis of the organ most involved leads astray. For here, as in a complicated typhoid, while at the outset there may be a predominance of symptoms definitely pointing to one viscus involved, sooner or later all share in the disturbance, and the picture is very complex. Nevertheless, Davis and Foulkrod propose to call the toxemia hepatic, nephritic, gastrointestinal, thyroid and parathyroid, placental and fetal. These seem more of value theoretically than practically, and remind one of the elaborate number of varieties of nephritis from the pathologist's standpoint while the clinician restricts himself to two or three.

We may say, however, that with the involvement of the *liver*, the chief organ of metabolism; of the *kidney* the chief organ of *excretion*; and the *nervous system* the chief organ of *expression*, these form the basis for otherwise distinct phases of toxemia of pregnancy and Cragin's suggestion seems not irrational. He calls the types:

*Hepatic* with the vomiting, jaundice, pruritus, hemorrhagic tendency, and slight or no edema, and slight albuminuria.

*Nephritic* headache, nervous disturbances, marked albuminuria and edema, and high-tension pulse.

The nephritic type may be primary but is oftener seen after prolonged operation of the hepatic, though it may not occur at all; this is exceptional, however. The nephritis of the later months is often foreshadowed in the persistent vomiting of the early months. It appears probable, however, that some diffusible toxin is necessary for the occurrence of the actual seizure and Ewing thinks it may be some form of ammonia.

In referring to *symptomatology* we shall refer only to what is learned from examination of urine, blood, eye-grounds and blood pressure, with a word of caution that their values are not absolute. Any one symptom or fact of clinical pathology must be weighed in its relation to the whole. The surgeon is not misled by an absence of leukocytosis in appendicitis, with other signs and symptoms pointing to operation, and it is so here, for anyone or all may be absent or modified.

*Urinary* changes appear early in toxemia; there may or may not be albumin and indican, but since 9 to 16 per cent. of eclampsias show no albuminuria, its absence throughout pregnancy no longer misleads the careful observer. In the later months, traces of albumin alone are not essentially bad, and there are those who regard this as not abnormal; but in the later months of toxemia, the increasing amount of albumin with falling twenty-four hours' quantity and specific gravity in proportion, is the usual finding, but even here exceptions are noted in 2 to 10 per cent. of cases. The presence of leucin and tyrosin is an aid to diagnosis but not so valuable as the nitrogen partition. Recent work by Bailey and Murlin has thrown doubt on this in the later months of pregnancy and their findings are so striking that if confirmed by further investigation, another supposed diagnostic aid must be rejected. However, at this period, fortunately, other signs are available and the value of nitrogen partition is still affirmed in the early months; at that period acetone and diacetic acid aid us if present.

The normal N excretion in health is 15.8 grams per diem, of which

Urea represents.....	87.7 per cent.
Ammonia.....	3.3 per cent.
Creatinin.....	2.7 per cent.
Uric acid.....	0.7 per cent.
Purin bodies.....	0.7 per cent.
Undetermined or rest N.....	5.6 per cent.

As age, sex, diet and various physiological conditions affect in an undetermined way the excretion of N any analysis to be reliable must be made frequently in the same case; but the average case of toxemia in the early months, at least, will show the following changes: lowered urea nitrogen; a variable ammonia nitrogen, usually high but often low; but quite uniformly a high undetermined or rest N taking up much of the lowered urea content. It is not so much the alteration in any one constituent as the ratio of these one to the other that is important and this will explain why cases of pernicious vomit-

ing fail to show the high ammonia coefficient we had expected to find. The greatest changes in the N partition are seen in the cases where the liver involvement is greatest and the percentages may be practically normal if the case is wholly nephritic. If the disturbed ratios are not corrected by dietetic, hygienic or other means, eclampsia will almost surely result.

Valuable as is the information gained from the estimate of the N partition it is strictly a laboratory procedure and one possible in only those laboratories equipped to do a difficult, tedious and expensive analysis, and hence, not of practical value to the general practitioner, who, as a rule, first sees these cases of toxemia; and even though Groat plans to simplify the test so that it may be done in the office, it will lead to errors in results unless even there the analyst be capable of intricate laboratory work and calculations. The value of the test is great, but in the later months we must have something more immediately available for our purpose, for it is the proper handling of the incipient toxemias that prevents eclampsia as a rule.

I believe we have this in the repeated routine examination of blood pressure which should be taken as often as the patient is seen throughout pregnancy. While of not so great value in early pregnancy, it nevertheless lends aid, and the few cases that go into convulsions with low pressure, whether early or late in pregnancy, are not so common as to negative its value, but merely serve to keep the attendant constantly on his guard. Ruling out cases with pre-existing nephritis and thick arteries the *normal* pressure should be at all times under 150 mm. of Hg. It is low in the early months, rises gradually during last eight weeks reaching maximum at beginning of last week before delivery, and drops immediately at termination of labor. Cases that go above 150 at any time need watching as it is these that show beginning trouble and at any time the pressure may soar and eclampsia occur. Cases of moderate hypertension (under 180) with thick arteries and no albumin are not as great significance as those that show an acute nephritis, or an acute exacerbation of the chronic form. This latter class is the one that can be benefited by rest in bed, diet, catharsis, irrigations, nitroglycerin, veratrum viride, and thyroid extract, standing ready to act whenever the pressure rises. Hirst says if he can't keep the pressure under 180 he empties the uterus. Pressure is almost always high in eclampsia, it is the most reliable prodrome, not depending on presence or absence of albumin. The prognosis is unfavor-



able if the pressure is high even if other symptoms disappear. High pressure can exist and continue without convulsions and with little or no albuminuria. Here the prognosis is just as bad as with the convulsions unless pregnancy be ended. These cases are very important because hard to recognize without the sphygmomanometer.

The ordinary leukocytosis of pregnancy (14,000 to 15,000 in i-para; 10,000 to 12,000 in x-para) is increased in toxic states and in proportion to the severity of the trouble if the bodily resistance be good; here a sudden increase indicates an aggravation of trouble, as does a rapidly falling count. A low count in a highly toxic state is bad. In eclampsia 50 to 100 per cent. increase is seen.

When the so-called albuminuric retinitis or other forms of toxic neuroretinitis, or marked changes in visual fields are present, they constitute the most urgent indication we have for evacuating the uterus. Blindness may be the result of failure to do this. Lesions of the optic nerve and retina can exist without complaint of loss of vision and the eye changes often occur before the nephritic changes. A demonstrable amaurosis is sufficient cause for ending pregnancy even in absence of dizziness, nausea and convulsions for waiting may not only precipitate the convulsions, but the life as well as the sight be jeopardized. The occurrence of eye signs in pregnancy is seen only with acute intoxications; if seen in early months, immediate termination of pregnancy is demanded if vision is to be saved; in the last few weeks careful watching is preferable.

Treatment is a large enough topic to occupy the whole of several evenings and we shall merely touch on the principles. Individualism in treatment of patients is nowhere more urgently called for than in the toxemia of pregnancy.

For the *toxic vomiting*, rest in bed, correction of any malposition of uterus, lavage (possibly with solution of  $\text{NaHCO}_3$  especially with acidosis present, allowing some to remain in stomach), no food by mouth, but enemata of nonfermentable carbohydrates of saccharose, lactose or dextrose, preferably lactose or dextrose, as these save the already damaged liver from dividing the saccharose; inhalation of oxygen recommended by Fry, are indicated. If these measures fail, especially with presence of disturbed nitrogen ratios, acetone and diacetic acid, very high or very low leukocyte count, terminate pregnancy as delay is dangerous, for the liver changes may have progressed to the point where recovery, even after delivery, is im-

possible. The method of terminating will depend on the period of gestation, the condition of the soft parts, and the general condition of the patient (Polak), and let it be said this applies equally as well whether we are facing toxic vomiting, preeclampsia or the convulsive stage.

*Preeclampsia.*

1. Reduce products of metabolism requiring elimination by careful dieting.

2. Favor the elimination of the products:

- (1) *Through the skin* by sweating.

- (2) *Through the kidney* by ingestion of considerable water.

- (3) *Through intestinal tract* by laxatives and colon irrigations, sugar solution better than salt solution if kidneys are involved.

- (4) Reduce blood pressure by venesection, veratrum, nitroglycerin, and thyroid extract; choral may be open to the same objections as  $\text{CHCl}_3$  if it be true that chlorin is the damaging element.

If all these methods fail then deliver. Williams believes that 8 to 10 grams of albumin per liter of urine justifies interference irrespective of other symptoms.

*Eclampsia.*—Just a word of consolation for those who have had patients go into convulsions, even with careful watching throughout pregnancy, and who have felt blameworthy because of the accident. Williams says he has seen it occur where a careful examination of the patient, urine included, on the day before the seizure revealed nothing abnormal, and this experience can be duplicated in any service where a large number of waiting women are admitted.

In treating the actual convulsive seizure opinions vary, as they always have and probably always will, from the severe conservatism of Stroganoff to the radical operative procedure at the first convulsion. Stroganoff's methods have been misstated, and perhaps a word correcting such mistaken ideas may be not amiss. The patient is given  $\frac{1}{4}$  to  $\frac{1}{3}$  grain of morphine as soon as admitted, is isolated and kept absolutely quiet, only physician and nurse allowed to enter the room which is kept dark; any necessary vaginal examination is preceded by inhalation of twenty drops of chloroform; catheterization and hypodermoclysis are preceded by slight anesthesia. One hour after admission 20 to 40 grains of chloral are given in milk per rectum; at the third hour another  $\frac{1}{4}$  grain of morphine by hypo. To maintain the narcosis 30 grains of chloral are given at the seventh hour; 20 more at the thirteenth and twenty-first hours and then 20 to 30 grains three times a day for three days.

Chloroform is given at any time a convulsion threatens. Hot-water bags, hot blankets, saline solution and food, tea or milk, by rectum, combined with oxygen inhalations are carried on as part of the treatment throughout. His mortality is 7 per cent. in 700 cases.

In spite of this glowing record, which some assign quite as much to the isolation and the quiet as to the sedatives employed, the majority of observers believe that the sooner after the first convulsion the uterus is emptied the better the prognosis. This does not mean accouchement forcé, for that should be avoided in all methods of treatment which will either reduce the resistance of the patient or seriously damage her organs.

Again let me repeat that the method of termination will depend on the period of gestation, the condition of the soft parts, and the general condition of the patient (Polak).

Where for any reason delivery cannot at once be done, open all channels of elimination, wash out the stomach, leaving in either Epsom salts 1 ounce, or oleum tiglium 2 minims; sweating to be induced by hot packs, or dry heat, hypodermoclysis, and enteroclysis, both of dextrose or sugar solution; enough veratrum viride to lower pressure and pulse, given guardedly, as determined by pressure (Judd), aided by nitroglycerin in sufficient amounts. Bleed freely, and this may be used as well after delivery where convulsions continue, no matter what the character or rate of the pulse, one writer states. Harrar distended the breasts postpartum with oxygen and found it of value, believing it to isolate a portion of the toxins concentrated in the breasts, until the breasts become actively secreting.

Serotherapy offers a promising field for investigation. Zangmeister's trephining in cases that did not clear up might be employed in desperate cases. Lumbar puncture aids in reducing the cerebral edema and has proved of value. The addition of calcium lactate, grains xxx to each enema every 2 hours is recommended by Brown.

Perhaps some day our treatment will be placed on a rational basis, but that will not be until the etiology is more definitely determined; until that happy time we shall have to treat toxemia as our forebears did—symptomatically.

#### SUMMARY AND PERSONAL CONCLUSIONS.

1. Pregnancy in many cases is not physiological and in all cases is so close to pathological that slight additions make it frankly so; further, the profession and laity are slowly coming to this view.

2. There will be fewer cases of severe toxemia if we pay closer

attention to the minor ills of pregnancy and regard them as possibilities of future trouble.

3. While the various types of toxemia are probably phases of one disease, no one definite etiology obtains in all cases.

4. A predisposing cause being admitted, the pathogenesis of the toxemia cannot be stated with accuracy at the present time, beyond the unsatisfactory term, "disturbed metabolism."

5. Usually the types are found to conform to one of two forms, hepatic or nephritic, with the former often causing the latter.

6. The urine systematically examined in toxemia for nitrogen partition where possible, as well as albumin, acetone and diacetic acid will aid in diagnosis and treatment in the early cases and possibly the later stages as well.

7. Blood-pressure examination is of value in all stages of toxemia, especially that of the later months, and should be taken as often as the patient is seen. No rise can be regarded lightly and may be the first sign of trouble. The few serious cases in which pressure is low must be considered exceptional and do not negative the value of the test.

8. The leukocyte count shows the resistance of the patient and the progress of the disease.

9. Eye signs furnish an urgent indication for terminating pregnancy, if seen early.

10. In treating the actual convulsive seizures, the sooner the uterus is emptied after the first convulsion, avoiding accouchement forcé, the better the prognosis for mother and child. Where the attendant is not capable of major surgery and the surroundings incompatible with clean work, conservative treatment (perhaps Stroganoff's method) will be wisest. Venesection in advance of delivery may not always be wise as the additional blood lost in operative procedures plus the shock of the operation may prove too great. Venesection, no matter what the character or rate of the pulse, as proposed by one writer, seems unjustifiable.

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## SOME OBSTETRIC OBSERVATIONS PERTAINING TO INTERNAL SECRETION.

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AFTER fourteen years of general practice with over 400 births without a maternal death, I was unfortunate in having two deaths in six months.

These were so unusual that I think it of interest and value to report them with some suggestions as to the possible cause of death.

CASE I.—F. McD., twenty-seven years, primipara. The pregnancy was normal except for some slight digestive disturbances in the earlier months. Urine normal. Pregnancy came to an end thirteen days after the date of expectation.

Pains started in the early morning but were not severe. Amniotic sac ruptured shortly after. About 4 P. M. pains became more troublesome, rapidly increasing in frequency and severity, and at 10 P. M. she delivered herself; placenta was expressed soon after. There was a rather free flow of blood, but not more than 14 to 16 ounces, readily controlled by a very hot douche. Pulse was a little rapid.

A half hour later I was going to leave but found her pulse 110 and decided to wait till it was reduced some. Bleeding had ceased, uterus was well contracted but very sensitive. From that on her pulse kept creeping up and getting weaker. She was restless, with a peculiar yellow color, lips not blanched, no air hunger. At midnight pulse was 150 to 180, irregular and thready. She was stimulated with strychnine, atropine and small dose of morphine. Finally I gave her 20 ounces of normal saline into a vein with excellent results on pulse which fell to 120 and became quite regular.

But in a half hour it was again rapidly getting worse. Dr. Frank Hammond saw her and could find no cause for collapse. At 3 A. M. Dr. Geo. M. Boyd was called in and could find no cause for collapse.

Finally at 4 A. M. I gave her 15 minims of tr. digitalis by hypo. Patient was very restless, sallow in color, uterus well contracted, pulse impossible to count at times on account of irregularity.

At 6 A. M. pulse had dropped to 65 but felt unusual, low tension,

each systole caused complete filling of vessels. At 10 A. M. suddenly collapsed, became pulseless and died. Consciousness was retained to the very end.

No autopsy was made.

CASE II.—A. B., aged forty-two, nine children, all normal births.

On Wednesday, November 29, 1911, amnion ruptured. No pains followed. On following day, Thursday, had severe attack of nausea and vertigo but managed to keep around, though feeling badly all day. There were some pains during the night, and she called in her physician, Dr. Gulick. The following morning he left, asking to be called when the pains became worse.

On Saturday, December 2, 1911 (three days after rupture of amnion) I was called in as Dr. Gulick was ill. Pains light and frequent. Movements of child and fetal heart normal.

I was called in again at 4 A. M. on Tuesday, December 5, 1911, six days after amnion had ruptured. She had been having hard pains for an hour or more. Normal but rather small child was born at 9 A. M., no hemorrhage, uterus well contracted, felt a little nauseated, pulse 80.

I left at 9.30 and was called back almost immediately from my office, patient having vomited and feeling very weak; pulse 95, uterus well contracted, no hemorrhage. Patient gradually became weaker, more vomiting, pulse became more rapid and softer, patient became sallow. I stimulated her to no avail with strychnine, camphor, atropine and enteroclysis; uterus still well contracted.

I called in Dr. R. C. Norris at noon. He expressed about 12 ounces clot from uterus which had relaxed some. Hypodermoclysis, enteroclysis of coffee, digitalis and whiskey. Pulse improved a little for a short time and then ran up to 160–180, irregular, thready; patient anxious, vomiting, uterus very sensitive, pressure causing immediate aggravation of symptoms. Finally at 3 P. M. she died; consciousness was retained to the very end. The family allowed me to open the abdomen. Uterus was rigidly contracted and blanched, no rupture. The intestines were blanched and filled with large amount of saline that had never been absorbed.

Both of these cases—one a young primipara, the other an old multipara—after simple spontaneous labors died within a few hours of vasomotor paresis.

In the young primipara filling the vessels with normal saline caused the heart to become slower, regular and stronger.

Dunlap (*Jour. Amer. Med. Asso.*, Sept. 10, 1887) reports two cases, one a young primipara, after a normal although very painful labor, seemed to be in unusually good condition considering her acute suffering. A short time after when preparing to leave the room, the patient asked him to return as she felt faint. This was followed by dyspnea, turbulent tossing and nausea, no hemorrhage, uterus well contracted, pulse rapid, weak and at times lost. Four hours later she



died suddenly. The second case was an old multipara with spontaneous rather precipitate labor, with practically the same symptoms except the restlessness. She died in five hours, apparently of shock.

The discussion on the above paper contained a report of a case by Rosenthal, a multipara dying in a half hour with same symptoms, no hemorrhage, uterus contracted and no cause for shock. He asks "What was the cause of death if it was not due to thrombosis or embolism?" Wathen in the same discussion reports a primipara with same symptoms after normal delivery with slight easily controlled hemorrhage and death within an hour.

Dr. C. N. Sturtevant also gave me notes on a case he had recently in his practice of a young primipara with a normal pregnancy and short labor (three hours) followed by a small readily controlled hemorrhage before placenta was delivered. Soon after her pulse began to run up and became weaker, and despite stimulation including pituitrin, hypodermoclysis, enteroclysis, died four hours later. Both he and his consultant were at a loss for a cause for her cardiovascular collapse.

Hurd (*Med. Record*, N. Y., 1882, xxii) reports a normal multipara with simple delivery, no hemorrhage, and no cause for shock, dying shortly after delivery. He says "till better informed we must regard them as cases of cardiac paralysis any explanation of which must be hypothetical."

Lusk (*Journal Amer. Med. Asso.*, 1884, vol. iii) also reports a similar case in a young healthy primipara. In his discussion of the case, he reports two other cases supposedly due to pulmonary embolism or thrombosis in which at autopsy no cause was found.

Chamberlain (*Toledo Med. and Surg. Journal*, 1872, vol. ii) reports a similar case in a young healthy primipara, in labor six hours, no hemorrhage, nausea followed by collapse three hours later; nothing was found at autopsy; syncope was given as the cause of death.

In reading over the literature one is impressed with the frequency in which thrombosis or embolism is given as cause of death and how infrequently it is found in cases coming to autopsy. The more I study the cases the more probable does it seem that this cardiovascular collapse is due to some marked disturbance of internal secretion, the lack or excess of some hormone, a hyposecretion or hypersecretion of a ductless gland. A hormone, the chemical messenger of Starling, is a chemical body formed in one organ causing a specific increase in activity of another organ. This chemical stimulation of cells is well seen in the attraction of the sexual cells one to another, the amoeboid movements of the phagocytes, the action of the secretin

from the duodenal mucosa on the pancreatic cells, the action of fetal extract on the mammary gland, and pituitrin on the uterus.

After even a most superficial examination of the literature on the ductless glands, one is struck with the marked changes taking place in most of them during pregnancy. The enlargement of the thyroid during menstruation and pregnancy has for years been common knowledge. In pregnancy (Vincent, "Internal Secretion and the Ductless Glands") the pituitary becomes hypertrophied even to two or three times its normal size and a marked change takes place in its internal structure.

This may account for the enlargement and heaviness of features, especially of the lower face seen rather frequently during pregnancy.

Dr. J. C. Scott has given me notes on an interesting case. The patient, twenty-seven years old, had previously had a three months' miscarriage and an eight months' premature birth. About the seventh month of her third pregnancy, her expression began to change and by the eighth month she had typical well-marked acromegalic enlargement of the face and hands. There was no other abnormal condition. She had a dead baby at full term. Six weeks later the acromegalic symptoms had entirely disappeared. Since then she has had an eight months' premature child that is still living and well.

The gland involutes slowly after birth but not completely. In multiparæ the size may remain three times as great as a normal gland.

One has only to use the extract of the posterior portion of the pituitary a few times in protracted labor to be convinced of its marked stimulating action on the uterus. W. Blair Bell has an excellent and very complete article on the pituitary gland and its chemical uses in the *Brit. Med. Journal*, 1909, vol. ii, as has also S. J. Aarons in the *Lancet*, 1910, vol. ii. Ott ("Internal Secretion") has shown the great increase of milk secretion after injection of pituitary extract.

Fetal and placental extract also greatly increase the size and activity of the mammary glands. Pepere (quoted by Ott, "Internal Secretion") had four cases of eclampsia; in three he found two parathyroids missing and in one he discovered a severe injury of one parathyroid due to cystic degeneration. Zanfrotnini (quoted by Ott, "Internal Secretion") found in a case of eclampsia only two parathyroids present and no trace of hypertrophy of them. He also treated five cases of eclampsia with parathyroidin with excellent results. The Italians seem to attach great importance to hyposecretion of the parathyroids as a cause of eclampsia.

There seems to be no doubt of the relation of the secretory

activity of the ovary with the development of the uterus, the mammary glands and the menstrual cycle, and the special activity of the corpus luteum in pregnancy increasing so greatly in size as it does.

Osler ("System of Medicine") states the usual age of onset of exophthalmic goiter is between the twentieth and thirtieth years. There is often improvement of symptoms during pregnancy, although the symptoms may, at times, be first noticed during pregnancy.

Geo. Murray ("Twentieth Century Practice of Medicine") states that 70 per cent. of myxedema cases occur between the ages of thirty and fifty-five, especially in those who have borne a number of children. Osler states that average age of onset of myxedema in women is thirty-eight. Sterility is frequent. Improvement of symptoms has often been observed in pregnancy. Both of these diseases are far more frequent in females than males. Here you see hyperthyroidism more frequent in period of greatest sexual activity and hypothyroidism more frequent in the period of decline of sexual activity around the menopause, and associated with it there is frequently sterility. In both there may be improvement of symptoms during pregnancy. A possible explanation for this is that an already overworking gland may not be able to respond to the excitation of pregnancy, but the excess already being secreted may be used up in the metabolism of pregnancy. In certain cases of myxedema the poorly functioning gland may be whipped up to better secretion with a corresponding improvement in symptoms of myxedema.

So far there has been no satisfactory explanation of the normal bradycardia of the puerperium. It is not due to exhaustion, because it is found most frequently in the most vigorous and normal cases, and not in exhausted or highly neurotic cases.

Recently I saw two cases of pregnancy in women suffering with exophthalmic goiter that seem to throw some light on this question.

M. F., thirty-one years, married eight years. Father in young adult life had enlarged thyroid, rapid pulse, prominent eyes and tremor; at the age of sixty-six he died with severe asthma, sclerotic kidneys, myocardial degeneration, and high blood pressure. Her sister had a constant abnormally rapid pulse, enlarged thyroid, periodic attacks of hay fever even in the winter. The patient herself for a number of years back had a rapid pulse. She has had two premature children, one at seven months, now seven years old who until recently had periodic attacks of abnormal appetite, constipation and fever culminating in convulsions. The second

child was born at end of eight months and is apparently normal. During this last pregnancy she almost lost the products of conception at the fifth month. Some time after that she came to me complaining of violent rapid throbbing of her heart, tremor, and nervousness; she could not control herself, eyes were more prominent and some slight enlargement of her thyroid. Under bromides and spartein her heart quieted down but the pulse still remained about 115 to 120.

The day following a normal labor her pulse was 90 and during the whole puerperium ranged from 80 to 90. Her other symptoms also cleared up.

C. DeB., thirty-one years. Mother had severe attack of exophthalmic goiter from which she has recovered. Sister is very nervous and emotional. The patient herself has had attacks of hay fever and asthma since she was three years old. I first saw her in May, 1905, when she had a six weeks' abortion. At that time her pulse was 110 to 120; she was nervous, had a marked tremor, and unusually prominent eyes but no goiter. She had a marked mitral stenosis. Menses were always scanty and irregular.

After her abortion she gradually became worse, pulse running up to 130 and 140, heart throbbing violently, in fact I have counted her pulse sitting 4 feet away from her, the presystolic murmur was so loud and the heart beating so violently. Under bromides and spartein her symptoms would improve for awhile and she would stop coming to the office. In March, 1907, I first noticed a goiter. In November, 1907, she became pregnant. Toward the close of pregnancy her symptoms improved somewhat, the pulse dropping to 116, and she had better nervous control over herself.

Finally, July 24, 1908, after eight hours of slight pain and eight hours of hard labor pains she delivered herself. She stood the labor exceptionally well with no hysterical or emotional disturbances. The following day her pulse had fallen to 85 and remained between 70 and 90 until the seventh day, when it fell to 66 and continued about this point until she sat up when it went up a little. All her other symptoms were greatly improved, the goiter becoming much smaller. In October there was some exacerbation of symptoms and in December a slight attack of hay fever and asthma. A year later her pulse was 100, heart quiet, nervousness much better, general condition excellent.

July, 1911, pulse 72, can hardly hear the mitral presystolic murmur but now one can hear in addition a soft diastolic murmur along the sternum with capillary pulsation of finger nails. Occasionally she comes in with some slight exacerbation of symptoms.

In both of these cases on the first day of the puerperium a constantly marked high pulse, 115 to 120, fell to practically normal and remained there for months. Here a very great readjustment of the activity of the thyroid gland took place, the pulse falling very rapidly, in one case even below normal. Mechanical causes could hardly account for this.

It seems quite possible that the normal puerperal bradycardia is due to the action of some hormone.

In closing I would like to give my reasons for believing that these cases of cardiovascular collapse are not due to myocardial disease, but rather to lack of peripheral vasomotor tone.

In the three cases quoted coming to autopsy no abnormal heart conditions were found.

These deaths are rather more frequent in young primiparæ. Myocardial disease is far more frequent after the fortieth year than in early adult life.

After filling the vessels in one of my cases with normal saline, thus bringing up the pressure, the heart responded beautifully only to fail again as the peripheral vasomotor tonus gave way farther.

We find these cases in peculiarly simple spontaneous labor of short duration and with but little cause of strain on the heart.

This failure of peripheral vasomotor tonus is quite possibly due to some abnormality of internal secretion. The following facts support this view.

The uteri were peculiarly well contracted and painful to pressure, as if in a cramp like that seen in many eclamptics. We find an unusually great increase in activity of a number of the ductless glands during pregnancy with an ever present possibility of glandular fatigue.

Ott and Scott (*Journal of Pharm. and Exper. Therapeutics*, vol. iii, No. 6, July, 1912) have shown that injection of thyroid extract causes an increase of adrenalin in the blood of the inferior vena cava. Hoskins (*Jour. Amer. Med. Asso.*, iv, No. 20, p. 1724, 1910) shows that feeding with thyroid extract causes adrenal hypertrophy.

In the two cases of exophthalmic goiter, the writer found a very great decrease in thyroid activity early in the puerperium; and adrenal insufficiency might follow this. An adrenal insufficiency could cause the cardiovascular collapse. The adrenal insufficiency might also account for the deaths in cases of moderate postpartum hemorrhage that at times so succumb unexpectedly.

RISING SUN AVENUE AND TABOR ROAD.

## COMPLEMENT DEVIATION BY CORPUS LUTEAN ANTIGENS.

BY

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THE fact that the ovary fulfils two functions—one of ovulation and one of trophic or nutritional activity—has been fairly well established. We now know that the ovary possesses a powerful influence over the nervous system of the individual, over the development of the uterus and of the breasts, and over the phenomenon of menstruation.

That such properties of the ovary reside chiefly if not entirely in the corpora lutea is strongly indicated by such facts as the following:

1. In experiments in which the ovary has been transplanted to an animal previously deprived of its own ovaries, no trophic results from the transplantation are seen unless the new ovary survives in such a condition that ovulation takes place—*i.e.*, an ovum is discharged and a corpus luteum is formed.
2. The destruction of the corpus luteum in the ovary of a pregnant rabbit prevents the complete development of the pregnant uterus and its contained ovum.
3. The destruction of the corpus luteum in a nonpregnant female causes the next menstruation to be missed.\*

Furthermore, it seems to be established that the corpus luteum acts through the medium of some internal secretion; for a reflex action through the nerves is disproved by the fact that a transplanted ovary containing lutean tissue will act almost as well as an ovary whose nerve connections are intact.†

The term "internal secretion" does not necessarily, nor indeed usually imply a substance of such a nature as would produce an antibody; and we have, of course, no right to postulate any such idea as a fact. We may, however, use the term merely as a convenient expression for an unknown quantity. The idea has suggested itself that if the ovary has such an internal secretion, an antibody may be generated in the blood serum of the woman. If so, might it not be possible to detect this antibody by a complement deviation test, using as the antigen an extract of corpus lutean tissue?

Dr. J. W. Miller,‡ working in Dr. Wassermann's laboratory, has experimented by immunizing dogs, rabbits, etc., with repeated

\* Fraenkel. *Arch. f. Gyn.*, 1910, xci, 705.

† Knauer. *Arch. f. Gyn.*, vol. lx, 1900.

‡ *Cent. f. Bakt.*, vol. xlv, p. 639.



injections of fresh corpus lutean tissue from cows and sows. Later, the serum of the injected animals, in combination with an antigen prepared from corpora lutea, will deviate complement. In Dr. Miller's paper the suggestion is thrown out that pregnancy might be diagnosed by some such test, the corpus luteum of pregnancy being so large.

To test this theory, a number of antigens have been prepared in different ways, and tested with serum from the blood of patients in the Lakeside Hospital, Cleveland. All the corpora lutea used were obtained fresh at operations in the clinic of Dr. Hunter Robb, to whom I wish to express my gratitude, not only for the use of the material, but also for his interest. The blood of the patients from whom the corpora lutea were removed was tested in almost every case by the Wassermann reaction for lues. In like manner, tests for syphilis were made upon the blood of those patients whose serum was used. These women were mostly young, and about half of them were pregnant. Serum from the blood of males was generally used as a control.

The antigen was prepared in one of three ways. What we have termed antigen A and antigen B in the subjoined tabulation of our results were obtained by following Noguchi's technic in preparing the pure lipoids, as described by him in "The Serum Diagnosis of Syphilis."\* This pure lipid was so diluted that 0.1 c.c. of a 0.6 per-cent. and the same amount of a 1.2 per-cent. solution could be used in the tests. The antigen designated A<sub>2</sub> was prepared according to the technic described by Dr. Miller in the article mentioned above. The corpus lutean tissue was chopped fine and placed in a normal saline solution containing 0.5 per cent. phenol. Three cubic centimeters of the fluid were used for each gram of substance. The emulsion was thoroughly shaken and the clear fluid decanted after standing. This was centrifuged till quite clear. The antigens termed C and D were simple alcoholic extracts of corpora lutea, the tissue being chopped fine and then extracted with ten volumes by weight of absolute alcohol for a period of a week, the flask being placed in the incubator. This technic was also used with the sheep's ovaries, which were extracted and tested with sheep's blood serum.

Through the great kindness of Drs. Dexter and Cummer, I was permitted to set up the complement fixation tests with the use of their hemolysin, guinea-pig complement, washed sheep's erythrocytes, etc. My thanks are especially due to them. The technic of this part of the work was that described by Swift.†

\* J. B. Lippincott Co., Phila., 2nd Ed.

† International Clinics, Series 20, No. 1.

The great difficulty in obtaining enough fresh corpus lutean tissue for making the antigens has been the chief trouble encountered in these experiments. For example, in the cases of antigens A and B, barely enough lipoid could be obtained from the single corpus luteum on hand to permit of the testing of a very few blood sera. The series of cases we have summarized in the accompanying table is, accordingly, quite small; and it is only the fact that our results have been negative that has led us to consider them of any value.

The blood sera of twelve women have been tested; and in addition that of ten male controls. Blood of male and female sheep has also been tested. There was complete hemolysis with both the sheep sera. In all these tests, a distinct complement deviation was noted seven times—four times with female sera and three times with that of male controls. Using Swift's scheme for denoting the degree of the fixation, we find:

	Male	Female
+++	2	I
++	I	0
+	0	2
+-	0	I

It is especially interesting to note that five sera gave a definite Wassermann test for syphilis—two female and three male. Every one of these syphilitic sera, whether male or female, showed a complement fixation with antigen made from corpus lutean tissue. The only other complement deviations observed in the series occurred very indefinitely, one being rated a (+) and the other only a (+-). As no Wassermann test was done upon the second of these, we cannot say whether or not the patient was syphilitic. One known luteic serum, from a male, showed complement deviation with one corpus lutean antigen, but complete hemolysis with another; and the same contradictory result was obtained with serum from one of the female patients. Antigen B was prepared from the corpus luteum of a patient whose blood gave a positive Wassermann test, and this fact may account for the (+) reaction mentioned above with the only serum tested with this antigen.

As it was impossible to find anything against which to standardize the antigens, the dilutions used had to be more or less empirical. The alcoholic antigens (C and D) were made up with 2, 3, 5, and 6 parts of normal salt solution. In each case, 0.5 c.c. of the mixture was used in a test.

#### CONCLUSIONS FROM THE SERIES OF TWENTY-FOUR EXPERIMENTS.

1. Attempts to detect the "internal secretion" of the corpus luteum by a complement deviation test, using extract of corpus luteum as an antigen, have proved negative.

2. An antigen prepared by extracting corpus luteum will deviate complement with the blood serum of patients giving the Wassermann test for syphilis.

## ANTIGENS.

		ANTIGENS:
Pure lipoids.....	A	from one normal corpus luteum.
	B	from one luteic corpus luteum.
Watery extract.....	A <sub>2</sub>	from one normal corpus luteum.
	C	from six normal corpora lutea.
Alcoholic extract.....	D	from two normal corpora lutea.

A CONTRIBUTION TO THE STUDY OF ECLAMPSIA AS A  
TOXEMIA OF POSSIBLE MAMMARY ORIGIN.\*

BY

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A RECENT editorial in the *Journal A. M. A.* calls attention to a contribution by Healy and Kastle on "Parturient Paresis and Eclampsia." Reading this article so stimulated my interest that I have prepared the following review of the whole subject of the possible origin of eclampsia in a perversion of the activity of the breasts. Since this theory of the etiology of the disease has its foundation in the astonishing clinical and pathological similarity between this gestational disorder of women and the disease of cows known as milk fever, or better as parturient paresis, I have thought it best to present first, a description of the latter disease, which until recently has, I believe, been all but unknown to the medical profession; second, a study of the case reports and literature of the former, considered as a possible mammary toxemia; and finally a consideration of the points of similarity and dissimilarity between the two and the possibility and probability of the mammary theory proving to be of value in solving the eclampsia problem.

## I. PARTURIENT PARESIS OF CATTLE.

*Nomenclature.*—In the United States, until recently, this disease has been called milk fever, a largely misleading title. The term parturient paresis is in general use in the Scandinavian countries, where the disease has been given considerable attention, and has recently received the sanction of Healy and Kastle in this country. In France, since the date of its first description there by Villeroi, in 1844, the term vitulary fever (*fièvre vitulaire*) has been most commonly employed. Although the bulletin of the United States Department of Agriculture is under the title Milk Fever, the author (Mohler) agrees that the term parturient paresis is the best and most descriptive of those suggested. The following list gives most of the commonly used names and most of them have their equivalents

\*Read before the Washington Obstetrical and Gynecological Society, December 13, 1912.

in the different languages: parturient apoplexy, puerperal typhoid, vitulary apoplexy, puerperal collapse, calving fever, parturition fever, puerperal eclampsia, vitulary eclampsia, dropping after calving, etc.

*Definition.*—Parturient paresis is a disorder of the cow (rarely and on dubious authority reported for the sow and goat), occurring only in association with pregnancy, labor, or the puerperium, usually in the first few days postpartum but also just before and during labor; characterized clinically by paresis of the limbs, convulsive attacks, and prolonged coma in the order named, by albuminuria, tube casts, glycosuria, and changes in the nitrogen partition in the urine; and characterized pathologically by hemorrhages in the liver and occasionally in the central nervous system, and by parenchymatous degeneration of the liver, kidneys, and, to a much less degree, of the heart and other viscera.

*History and Literature.*—The best and most scientific study of the disease that I have found is the article by Andre Delmer, *Theses de Paris*, 1904, entitled: "Contribution a l'etude de l'eclampsie vitulaire (fièvre vitulaire nerveuse des femelles bovines). Ses rapports avec l'eclampsie puerperale de la femme (Hepato-toxémie gravidique du Professeur Pinard)." Pinard acted as president of the thesis, and the author being a doctor of both human and veterinary medicine, and thoroughly familiar with vitulary fever, is well qualified to discuss the subject. The treatment is exhaustive and altogether admirable and I wish here to express my great indebtedness to this valuable, and to my mind, too much neglected contribution. The recent work of Healy and Kastle is also valuable and most stimulating; and reference should also be made to the two publications of the United States Department of Agriculture, Bureau of Animal Industry, a bulletin by Mohler, and the article by Law, in the 1908 edition of the Report on Diseases of Cattle.

According to Delmer the disease was first described by Eberhardt in 1793. Reference is made to it in the works on veterinary medicine by Jorg and Viborg in 1808 and 1818 respectively. It was first described in France by Villeroy in 1844, in his "Manuel de l'éleveur des betes a cornes." In 1872 Contamine demonstrated the presence of albumin in the urine and Nocard did the same for sugar in 1885. Various authors then attributed the condition to infection. In 1890 Cagny and Delamarre, and in 1897 Ehrhardt, demonstrated the constancy of the hepatic lesions. In 1897 Gratia advanced the theory that the disease was an autointoxication of mammary origin and in 1898 Schmidt introduced his very successful method

of treatment based on Gratia's ideas concerning the etiology. As indicated clearly by the long list of names already given, there is considerable confusion in the literature of the disease and in many instances it has not been properly differentiated from totally different postpartum conditions, as for instance ordinary postpartum infection. In France the effort has been made, particularly by Violet and SaintCyr, to distinguish between "eclampsia of female cattle" and "vitulary fever," and also to divide the latter into "fièvre vitulaire agité" and "tranquile," depending upon whether convulsions or coma dominate the clinical picture. After reading Delmer, however, it is easy to agree to his dissent from both propositions.

*Etiology.*—The predisposing factors in the etiology are all associated, apparently, with the greatest development along lines of milk production. The better the milk machine the more liable the machinery to disaster from this particular disorder. The incidence is much greater among the heavy milking breeds than among grade cattle or the fancy beef breeds. Thus among Jerseys and some herds of Holsteins it is said to be seen more frequently than are cases of human eclampsia. Animals having the run of a pasture for the few weeks before calving are much less liable than those kept in a stable. Good condition, rich food, and overfeeding all predispose. Multiparity plays an important part, some authorities claiming that cases occur only after the first calving. Delmer states, however, that the disease has been observed in primiparæ. In twenty-nine cases in which this point was noted Haycock found three animals with the disease after the third calf, five after the fourth, sixteen after the fifth, two after the sixth, and three after the eighth. It is also well established that an easy normal birth seems to predispose, as cases are rarely seen after difficult or prolonged labors, especially those requiring the services of the veterinarian, and an increase in the amount of hemorrhage. Cessation of milking in the last few weeks of pregnancy also seems to have an effect as in animals thus managed cases are more frequent than among animals which have been milked throughout gestation. It will be readily seen that all the factors mentioned above point to some disturbance in the function of the udder as the essential cause of the condition, and it is now generally believed that parturient paresis is essentially a toxemia resulting from some perversion of the glandular activity of this organ. This hypothesis receives abundant confirmation from pathological and therapeutic data to be mentioned, but it would be well to consider the experimental evidence which has been adduced.



In this connection the most suggestive and scientific work has been done by Healy and Kastle. These investigators conducted a series of experiments, well controlled, to determine the toxicity for guinea-pigs of the colostrum from animals affected with parturient paresis. Briefly their results were as follows: Milk and colostrum from normal cows injected intraperitoneally into guinea-pigs produced only a few slight, transitory phenomena, which left no permanent results, and the animals all lived. In the case of animals injected in the same way with colostrum obtained from diseased cows, the result was the production of an illness invariably fatal in five or six days. Autopsies in these cases always disclosed acute degenerative parenchymatous nephritis, acute hemorrhagic necrotic hepatitis, and degenerative changes in the adrenals. Delmer conducted a few experiments with cows to determine the results of intravascular injections of colostrum from cows with vitulary fever. He first showed experimentally that the injection of colostrum from healthy cows gave rise to only transitory phenomena of no apparent significance. In the cases where the colostrum used was obtained from diseased animals he was able to produce, by the injection of several hundred cubic centimeters into the jugular vein, symptoms which very closely resembled those of vitulary fever. In one case the cow experimented upon died, and in another case had to be killed.

*Pathology.*—In the attempt to clear up the mystery surrounding this disease the veterinaries appear to have paid but little attention to the pathology. Delmer, in reporting ten autopsies of his own, in mentioning the prior work, only refers to the fact that Cagny and Delamarre, in 1890, in a communication to the Central Society of Veterinary Medicine of France, called attention to the condition of the liver, which they said was pale and reminded them of that of a calf. In 1896 Ehrhardt reported seven cases of the disease, including three fatal cases with autopsies. This author noted congestion of the liver, with circumscribed hemorrhagic foci, and fatty degeneration of the parenchyma. These lesions were constant. Some degenerative changes in both skeletal and cardiac muscle were noted occasionally, less often edema of and hemorrhage into the central nervous system. The kidneys, spleen, lungs, and uterus were thought to be normal.

Delmer's own work on the pathology, based on a series of ten autopsies, possesses an extraordinary interest. He divides the lesions found into essential and secondary, defining the former as those found constantly, in varying degree, and inherent to the malady. Of them he says: "The former (essential lesions) . . . are

most interesting because of the analogy they present to those which Jurgens, Piliet, and more recently Bouffe de Saint-Blaise, and Guiesse have described in eclamptic women." The most constant and serious of the lesions found were those of the liver. Invariably there were present hemorrhagic extravasations under the liver capsule and into the gland substance, usually about the size of a one franc piece, but in two of the cases large subcapsular hemorrhages, occupying a quarter of the liver surface, were found. In two cases the bile was found to be hemorrhagic without obvious lesions of the gall bladder. But to quote:

"When one examines under the microscope, with different magnifications, a section of the liver obtained in the neighborhood of the hemorrhagic foci, one is struck at once with the decided changes in the vessels of the portal spaces: some are still intact but enormously dilated and filled with blood-corpuscles . . . . , a certain number are thrombosed; others are clearly ruptured and the blood is poured out all around the torn vessels, making the cellular elements unrecognizable. The intralobular capillaries are also uniformly dilated or, here and there, are ruptured; in certain places the ectasia exists throughout their length, from the portal space to the portal vein; in others it is more pronounced in the peripheral or median part. The central veins of the lobules generally retain their normal dimensions. In portions of the live parenchyma situated between the large hemorrhagic extravasations the microscope reveals small ruptures of the capillaries not visible to the naked eye. The liver cell is altered. It is elongated and deformed by the vascular congestion and the hemorrhage. Often it is seen to be degenerating—osmic acid shows small droplets of fat. Most of the cells retain their nuclei but they stain poorly."

Kidney lesions were also found constantly. Grossly there were congestion and a few small hemorrhages under the capsule. Microscopical examination showed congestion of and hemorrhage into some of the glomeruli, and in some cases a slight interstitial infiltration. To quote, however:

"But the dominant lesion, the one always noted, is a degeneration of the convoluted tubules. In certain cases the epithelial cells are completely destroyed and all traces of cellular organization have disappeared; there remains nothing but the outline of the tubule filled with granular debris. More often one can vaguely distinguish the form of the cell but the nucleus no longer exists, and the granular protoplasm stains poorly; or the nucleus persists and only the protoplasm is degenerated."

The changes noted in the other viscera were briefly as follows: bladder, one small hemorrhage; spleen, congestion; heart, one small hemorrhage under the visceral layer of the pericardium; blood, darker and more viscous than normal, coagulated well, red blood cells normal, leukocytes increased, mononuclears predominating; nervous system, two hemorrhages, one in the medulla in a case of sudden death, the other in the cervical cord; uterus and udder, no changes of importance.

The secondary lesions found were aspiration pneumonia and mastitis. Both of these conditions were due to poor technic in attempts at treatment.

*Symptoms.*—Preceding the onset of the attack various prodromal symptoms may be noted. The animal stops eating, rumination ceases, the head is held low, the eyelids droop, and no attention is paid to the calf. There is considerable restlessness, some twitching of the muscles, particularly those of the neck, and it is noticed that the hind limbs seem to be weak. This latter condition increases, the front limbs become affected, and soon the animal goes down. After a few ineffectual attempts to get up it lies quietly in a state of increasing coma, which, however, is often preceded, and occasionally interrupted, by convulsions. These are usually clonic but may become tonic. The position usually assumed is more or less characteristic; the animal rests on the belly with the limbs drawn up under it and the head drawn sharply around against the flank, generally the left. Trismus is often marked and from time to time the head is dashed around with sufficient force to do the cow considerable damage if not restrained. The temperature varies greatly; in some cases it is elevated as high as 103, in others it is subnormal. Fever does not seem to be in any way characteristic of the disease despite its common name of milk fever. The pulse is not characteristic either, but gets weak and rapid toward the end. The blood pressure is increased. The disease terminates in death or recovery, usually in from eighteen to seventy-two hours.

The urinary findings are of great interest. Albumin is present in the great majority of the cases, but Delmer found it absent in five out of sixty-six cases. Sugar is usually present, Healy and Kastle finding it in the amount of 6.25 per cent., 2.2 per cent., and 1.64 per cent. in the analysis of urine from three different cases. It is not invariably found, however. Nitrogen in the form of ammonia is increased. The urine is decreased in amount and both suppression and retention have been noted. Microscopically granular, hyalin, and epithelial casts are all found (Healy and Kastle).

*Complications.*—Hemorrhages into the central nervous system may produce sudden death or hemi- or monoplegias. Gangrene of a limb has been seen. Bronchopneumonia and mastitis are frequently noted but are due to the attempt to drench an unconscious animal or to the careless introduction of infection in the injection of the udder.

*Period of Attack.*—As has been stated, parturient paresis is in the great majority of cases a disease of the puerperium. It usually occurs in the first forty-eight hours following labor, but is not rare at any time up to the end of the first week and has even been described later. Antepartum cases are more frequent than intrapartum. Well-authenticated cases have been described before full term. Jensen in 1,107 cases observed 1,050 postpartum and only fifty-seven ante- or intrapartum.

*Recurrence.*—As many as four attacks have been observed in the same animal in succeeding pregnancies. Some authorities state that one attack predisposes to another, and that the prognosis is more grave if prior attacks have occurred.

*Prognosis.*—Prior to the introduction of the treatment by injection of the udder the maternal mortality was from 50 to 70 per cent. Under the latest treatment this rate has been reduced to less than 1 per cent. In its usual postpartum form there seems to be no deleterious effect on the calf but in ante- and intrapartum cases a stillbirth is the usual result.

*Treatment.*—Prior to the introduction of the so-called new treatment, in 1898, by J. Schmidt, of Kolding, Denmark, it is to be greatly doubted if the animals were much if at all benefited by the treatment then in vogue. This consisted of bleeding, catharsis, wet packs, enemas and catheterization. Practically all the animals attacked within forty-eight hours of the birth died, no matter what was done for them. Schmidt, impressed with the theory advanced by Gratia that the disease was due to a toxemia of mammary origin, conceived the idea of neutralizing the toxin at its point of origin by injecting the udder through the milk ducts of the teats, with a solution of potassium iodide (1 1/2 drams to the quart). The result of this treatment was the reduction of the mortality to about 17 per cent. The treatment was tried extensively in other countries and its value proved beyond any doubt. The next step, stumbled upon by mistake, it is said, was the substitution of atmospheric air for the various antiseptic substitutes suggested and tried instead of potassium iodide. This led to the discovery that the efficacy of the treatment did not depend in the slightest degree upon

the neutralizing or antiseptic action of the injection, but rather upon the degree of distention produced in the udder, resulting in a diminution in its circulation and a consequent decrease in the supply of toxins to the general circulation. It should be noted that the idea has been advanced that the disease is due to the infection of the udder with an anaerobic organism and that the success of the air injection treatment is to be explained by the destruction of the germ by the action of the oxygen of the air. But this specious hypothesis fails to take note of the immediate reduction in the mortality which followed the use of Schmidt's potassium iodide solution. Nor can the efficacy of the new treatment be explained on the ground that the enormous distention of the udder with air forces a large amount of blood into the general circulation and thus relieves an anemia of the brain. It is obviously impossible that a disease with the pathology and symptoms already described should be due to a mere alteration of the distribution of the blood in the body.

In concluding the consideration of parturient paresis it would seem that the following conclusions are justified:

1. The symptoms and pathology of the disease can only be explained on the assumption that it is due to the circulation in the blood of a powerful toxin.
2. The predisposition to the disease shown by animals which by breeding or management are converted into milk machines and the wonderful reduction in the mortality from 70 to 1 per cent. by a treatment which certainly tends to limit absorption from the udder, point conclusively to a disturbance in the early milk secretion as the origin of the toxin.
3. The animal experiments of Kastle and Healy and of Delmer are corroborative of both these statements.

## 2. CASE REPORTS AND LITERATURE OF ECLAMPSIA TREATED AS A POSSIBLE MAMMARY TOXEMIA.

Bolle was among the first to attempt the treatment of human eclampsia along the lines which had proved so successful in the management of the corresponding disease of cattle. In his paper, after briefly describing parturient paresis, pointing out that it had been treated similarly to eclampsia without any material results, and emphasizing the enormous decrease in mortality which followed the udder injection treatment, he reports the results obtained in seventeen cases of eclampsia treated by a similar therapy in Ols-hausen's clinic. Bolle believed that the virtue of the treatment

lay in the action of the potassium iodide on the eclamptic toxin, and he seems to have had no idea that the local action on the breast was the point of importance. Thus in some of his cases the injection of the potassium iodide solution was made into the tissues of the infra-clavicular fossæ and not into the breasts. Of the seventeen cases two were moribund at the time of beginning the treatment and promptly died. Of the fifteen remaining cases one died, the fatality being in a case showing marked icterus, in which treatment was not begun until after the fifth severe convulsion. Bolle's work seems to have attracted but little attention and the whole matter remained in a state of innocuous desuetude for ten years.

In 1910 Perrson published in Swedish an article on "Puerperal eclampsia and puerperal paresis and a new method of treatment." His treatment consisted in the intramammary injection of air followed by frequent stripping of the breasts to remove from them all of the colostrum. He reports five cases, as follows:

CASE I.—I-para, twenty-four years of age. Postpartum eclampsia. Delivery at 4.15 P. M. At 7.15, 7.40, and 8.10 P. M. severe eclamptic attacks. Treatment was given after the last attack and at 8.40 the patient was conscious. No further convulsions. Recovery.

CASE I.—II-para, thirty-nine years of age. Delivery by vaginal Cesarean section at 1.30 A. M. Prior to delivery the patient had had nine convulsions, the last at 8 P. M. preceding the delivery, following which the treatment was begun. Recovery.

CASE III.—I-para, thirty-five years of age. Delivery by vaginal Cesarean section at 9.30 A. M. Six convulsions prior to delivery. Some improvement followed treatment but the patient died the next day. Autopsy showed the usual eclamptic lesions and also an extensive bronchopneumonia.

CASE IV.—II-para, twenty-one years of age. Antepartum eclampsia. First attack in the morning and the fifteenth and last after delivery at 6.20 P. M. Treatment was given after the ninth convulsion and repeated in 2 1/2 hours. Following the delivery the breasts were kept emptied. Recovery.

CASE V.—I-para, postpartum eclampsia, one convulsion following delivery on February 23. On the 25th patient complained of headache and the urine contained 1.1 per cent. albumin. The breasts were repeatedly emptied of milk and the headache promptly disappeared. On the 26th the albumin had dropped to .03 per cent. On the 28th the emptying of the breasts was discontinued. On the 3d there was 1.7 per cent. albumin in the urine and on the following day the emptying of the breasts was renewed. The albumin promptly decreased in amount and on the 27th, the date of the patient's discharge, amounted to .075 per cent.

In conclusion the author expresses his belief that a vicarious



functioning of the breasts has a very important part to play in the production of human eclampsia.

The paper of Sellheim, in 1910, probably served to arouse considerable interest in the whole subject because of the radical nature of the treatment suggested. This consisted in the amputation of both breasts in desperate cases, where the other and more usual means seem to be of no avail. Sellheim points out that the glandular activity of the breasts dates from an early period in pregnancy, as is evidenced by the fact that even following very early interruptions of pregnancy lactation not infrequently establishes itself. He does not eliminate the placenta as a possible source of the eclamptic toxin but holds that in early cases the source may be placental, mammary, or both. In cases occurring at the time of birth he believes the cause is to be found in the metabolic strain on the mother, already predisposed by the mental and physical strain of labor, of the sudden addition to the placental metabolism, of a rapidly increasing mammary metabolism, made necessary by the impending change from placental to mammary nutrition for the fetus. In the postpartum cases the causation of the trouble is unhesitatingly attributed to a perversion of the breast activity. In regard to the exact method by which the breast may produce the eclamptic toxin the author points out that it is unnecessary to presuppose the formation of a toxin in the breast, but that there may be elsewhere in the economy a link lost in the chain of harmonious interlocking internal secretions, which determines a loss of a normal detoxification of some normally breast-formed substance. Nor, says he, is the rôle of the kidneys in the production of eclampsia affected by the transference of the source of the primary poison from the placenta to the breasts. Sellheim reports the following cases:

CASE I.—I-para, strong and healthy, brought into the clinic totally unconscious. Several convulsions had occurred at home and five were noted in the ambulance. The cervix being undilated, a six or seven months fetus was removed by vaginal Cesarean section. A convulsion during the operation. Despite all the usual means of treatment, including enemas of sodium bicarbonate solution and the subcutaneous injection of large quantities of physiological salt solution, the patient grew steadily worse and eight convulsions were noted in the twelve hours following delivery. The coma became progressively deeper, the cyanosis increased, and the pulse rose to over 160 and could hardly be palpated. In the presence of a steady progress for the worse it was decided to inject potassium iodide solution into the breasts. 1,000 c.c. of salt solution with 1.5 grams of potassium iodide was then directly injected into the gland tissue by means of a force pump. This took about twenty

minutes at the end of which time there was an astonishing improvement. The cyanosis had decreased and the pulse was fuller and stronger. An hour later there was a profuse perspiration. The potassium iodide injections were continued at four-hour intervals. Following the third injection there was a temporary cardiac embarrassment, attributed to the action of the potassium. It was promptly relieved by stimulation and from this time the improvement was steady. The urine, which had been full of blood and albumin, cleared up rapidly, sight returned, and the patient left the hospital on the fourteenth day, cured.

CASE II.—Postpartum eclampsia. I-para, twenty-four years of age. Natural birth except for a bad tear of the perineum. First convulsion six hours postpartum. Convulsions followed about every half hour and the coma was progressively deeper and deeper. Totally unconscious, the patient was brought to the hospital twelve hours after the delivery, following the twelfth convulsion. Lips and tongue bitten, temperature 107.1, pulse 160, small and counted with difficulty, respiration 44. Tracheal rattling pronounced and numerous râles and ronchi over the chest. Slight abdominal distention, uterus well contracted, fundus at the umbilicus. Cyanosis. Edema of the external genitals but none of the limbs. The bladder contained 10 cubic centimeters of dark, thick urine, acid reaction, albumin 2 per cent., numerous granular casts. Under light chloroform anesthesia both breasts were removed subcutaneously through two curved incisions made under them. Immediately after the operation there was an eclamptic seizure. The pulse rate then dropped to 144 but remained small and compressible and somewhat irregular. Temperature 100.6. There were no more convulsions and the patient rapidly improved. The only additional treatment was some morphine. The only complication was some slight necrosis of some of the skin flaps. The loss of blood at the time of the operation was very slight. Complete recovery.

In conclusion, Sellheim, cautions anyone wishing to try bilateral excision of the breasts as a means of controlling eclampsia that, for the present, such treatment should be reserved for desperate cases in which no other satisfactory explanation of the condition can be found.

In 1911 Martin reported two cases of eclampsia treated by intramammary injections of oxygen. They follow:

CASE I.—I-para, thirty-six years of age. The patient was brought into the hospital unconscious, after the seventh convulsion, and was delivered at once by vaginal Cesarean section. Three grams of chloral and two centigrams of morphine were then given by rectum. Nevertheless for the next three hours convulsions occurred at thirty- to forty-minute intervals. The patient was totally unconscious, pulseless, with rattling breathing, and gave the impression of being moribund. One breast was then injected with oxygen until an emphysema could be felt over both breasts and arms. The convulsions ceased at once and a continuous improvement was noted.

In twenty-four hours the patient could drink and twenty-four hours later could answer questions. She recovered completely.

CASE II.—I-para, thirty-three years of age. Patient brought into the clinic unconscious and undelivered. A bag was introduced into the uterus and an oxygen injection given into both breasts. Following the birth another injection of oxygen was given into both breasts until emphysema of the face was produced but the convulsions continued and the interval between them becoming less the patient died in deep coma. At the autopsy the liver showed marked hemorrhagic necrosis and both kidneys were in a condition of fatty degeneration.

Martin concludes by saying that if the first case argues for the mammary theory of eclampsia the second does not, but that in such cases, where there is such a widespread destruction of both the liver and kidneys, all treatment, amputation of the breasts, oxygen injections, or any other methods, are worthless.

In the same year Herrensneider, fortified by the example of Sellheim, resorted to a bilateral amputation of the breasts in a desperate case of intrapartum eclampsia. This case is of remarkable interest if it serves to show nothing but the powers of resistance and recuperation of the human body. The report is as follows:

E. S., eighteen years of age, i-para, in the last month of pregnancy. Brought into the hospital unconscious, with bitten tongue, at 10 A. M., January 16, 1911. There had been but one convulsion, half an hour before entrance to the hospital. The urine had been examined fourteen days previously and found to be without albumin. Examination at the time of admission disclosed the following: great restlessness and continual struggling, face bloated and inflamed, limbs swollen and edematous, blood pressure 160 mm. Hg., pulse 100, temperature 97.2, respiration stertorous, the bladder contains a small quantity of urine rich in albumin and tube casts. Obstetrical examination: L. O. A., head movable above the brim, fetal heart distinctly heard, fundus at the ensiform, labor pains present, contracted pelvis, cervix just beginning to dilate. Patient placed in a Jaquet pack and chloral given by rectum following each convulsion. At 5 P. M., following the fifth convulsion, a living girl baby weighing 2,840 grams was delivered by abdominal Cesarean section with the fundal incision. The abdominal wound was closed in layers and Michel's clamps were used for the skin. After the delivery the blood pressure remained between 160 and 170 mm. Hg. and after an interval of about 2 1/2 hours the convulsions reappeared and continued at varying intervals during the night. In the morning the blood pressure had risen to between 180 and 190 mm. Hg., the pulse was 140, the axillary temperature 102, and as the patient gave the impression of being moribund it was decided to try the effect of an amputation of both breasts. This was done at 8.55 A. M. under light chloroform anesthesia and with the loss

of very little blood. The seventeenth and last convulsion occurred as the patient was placed on the table.

The post eclamptic coma lasted for forty-eight hours, during which time the eyes and mouth were kept tightly closed. There was a considerable amount of pulmonary edema and mucous poured from the nose in large quantities; great restlessness, especially at night, when the patient had to be held in bed by several attendants. The urine was loaded with albumin.

January 19. Patient opens her eyes for the first time and complains of thirst. Conscious at short intervals. Pulse range 140 to 160, temperature 102.6 to 104, severe coughing with labored breathing and much expectoration. Paralysis of the right abductens, diplopia, paralysis of the right leg, and absence of the patellar reflexes on both sides.

January 20. Temperature 103.7, pulse over 140. Examination of the lungs disclosed an area the size of the hand, under the right scapula, over which there was bronchial breathing and much rattling.

January 21. Severe coughing and much expectoration, patient somewhat stuporous but well nourished.

January 22. Patient was very restless in the night, had hallucinations and gradually became maniacal, so that it was impossible to keep her in bed. She would wander around the room for a while and then lie down from exhaustion. With interruptions this condition lasted for three days and nights. The pulse ranged around 120 and the temperature between 100.4 and 102.2.

January 25. After a very restless night during which there was a great deal of coughing, the abdominal incision gave way and almost all the small intestine protruded between the abdominal wall and the dressing. The patient was too stuporous to notice this. Without narcosis the gut was separated from the dressing and from its adhesions to the scar and replaced in the abdomen, covered by a pad drawn through the lower part of the wound, over which the whole thickness of the wall was drawn with silver wire sutures. The patient was now entirely conscious and realized the seriousness of her condition.

January 26. Temperature 104.4, pulse 160. On the next day the temperature ranges from 102.2 to 103.1 and the pulse from 120 to 140. After four days the gauze pad was removed and a deep wound left to heal by granulation from the bottom under adhesive strapping.

February 5. After two days of expectoration of bloody, purulent sputum a large quantity of bloody, purulent sputum was expectorated. Auscultation showed signs of pulmonary abscess below the right scapula, with cavity formation. On the following day the odor was so bad that the attendants could scarcely stay in the room. After this time the patient began to improve both subjectively and objectively.

February 24. The patient has little obstetrical interest. No disturbances have been noted during the past week but albumin still persists in the urine. The abdominal wound is healing well.

The wounds at the breasts, which had been a little inflamed, are nearly healed. The right abducent paralysis still persists. The sputum is still abundant and at times fetid. It is to be supposed that the patient will recover and be entirely well.

Herrenschneider is very conservative in the discussion of his case. He does attribute great importance to the effect of the breast amputations on the blood pressure. Following this operation the blood pressure fell from 190 mm. Hg. to 120 mm. Hg. and during the remainder of the stormy puerperium it did not get over 135 mm. Hg. The etiological effect of shock and blood loss in causing the fall in blood pressure is excluded on the ground that the greater shock and hemorrhage of the Cesarean section did not serve to prevent a rise in pressure from 160 to 190 mm. Hg. In conclusion, the author expresses the opinion that any proposed treatment for eclampsia is to be judged by its efficacy in lowering blood pressure. Measured by this standard he evidently thinks that amputation of both breasts is at least worthy of consideration.

A case of extraordinary interest is the one reported in 1912 by Gilles and Ducuing of which I have thought it wise to present an almost complete translation. It is as follows:

The patient was a i-para, twenty-four years of age, who had been in perfect health until the previous year when she had entered the hospital for lumbar pain. The physicians had suggested that the left kidney be removed but the patient refused and left the hospital.

Following her menstrual period of the seventh of March she became pregnant. No abnormalities until the fifth month when edema of the ankles was noticed. A midwife found albumin in the urine and advised an appropriate diet, thanks to which the edema cleared up; but frequent urinalyses showed the presence of albumin, which, however, did not increase in amount. On the morning of Sunday, December 10, pains were felt in the abdomen and the midwife diagnosed the beginning of labor. The pains were slight and infrequent, however, and the day passed without incident. The patient was bright, dined as usual, and retired at 10 o'clock. At about 11 o'clock she was taken with convulsions. The midwife called a doctor who bled the patient and advised that she be sent to a hospital. This was done at 3.30 A. M., at which time there had been twelve convulsions.

At the hospital the treatment consisted of high enemas, purgatives, chloral by rectum, and wet cups. Despite this treatment the convulsions continued and by 9 A. M. there had been 30. Between the convulsions there was profound coma. The obstetrical examination at this time showed the fetus in L. O. A. Fetal pulse 160, cervix dilated 2 to 3 centimeters.

Gilles first saw the patient at this time, 9.30 A. M. of the 11th. Coma constant, pulse 144, temperature 101.5 degrees, respiration

48 to the minute. One hundred grams of blood were now withdrawn together with 10 c.c. of cerebrospinal fluid, which was not under pressure. These were taken aseptically and preserved for examination. Three or four convulsions followed at once and the fetal heart could no longer be heard. At 10.30, the cervix being dilated about 4 centimeters a child weighing 2,630 grams was artificially delivered. It could not be made to breathe. The placenta, weighing 320 grams, presented no hemorrhagic foci, new or old. Sugar water was given continuously through a nasal catheter and theobromine was also administered but in spite of these procedures the convulsions kept up. The temperature increased to 102.7 and the pulse became irregular and uncountable. Toward 1 P. M. another purgative was given but the condition did not ameliorate. The convulsions, on the contrary, became more and more frequent, the temperature increased to 103.1 and the pulse remained uncountable.

At 2.30 P. M. an injection of air and oxygen was given in the mammary gland through the nipples and in the submammary tissue by means of a trochar introduced into the breast. Half an hour afterward it was distinctly evident that the pulse had become more forcible and could be counted at 160 to the minute. The respirations diminished from 48 to 40. Between 3 and 6.45 P. M. there were five convulsions; the pulse remained at 160 and the temperature at 102.2. At the latter hour another injection of air and oxygen was given in each breast. After half an hour, as after the first injection, the pulse became more forcible and diminished in frequency to 120. The respiration remained at 40. Besides, the patient, who up to this time had given no evidence of pain, repulsed our hands and cried out when the injection was given. We counted four further convulsions; the fourth at 8.15 P. M. was the fifty-fifth and last.

In the first part of the night the patient remained in coma, but toward morning she turned when spoken to loudly. The respiration was not stertorous, sensation about normal, temperature 99.3, pulse 116, respiration 20. Numerous involuntary stools. She was made to take sugar water through a tube and 1 1/2 grains of theobromine also. In the evening the pulse was 94, full and strong, temperature normal, and at 9 P. M. the patient spoke several words but did not understand questions asked her. The night was a good one. The quantity of urine for twenty-four hours could not be determined but appeared to be abundant. Albumin 1.5 by the Esbach method.

December 13. Purge of castor oil. Abundant stools. The patient speaks but is incapable of continued conversation and her replies are incoherent. Pulse 80, temperature 96.8. In the evening there was violent delirium, the patient trying to get out of bed. Pulse 120, temperature 98.2. The night was restless. Urine 1,850 cc. for the twenty-four hours. Albumin 1.

December 14. Morning, very abundant involuntary movements. Afternoon, patient speaks fairly well. Evening, slightly delirious,



temperature normal, pulse 112. Restless night. Urine about 2 litres, traces of albumin. On this day the patient was sufficiently quiet to permit examination and the following facts were noted:

*Urinary System.*—On the left side in the flank a large tumor of the size of two fists, long axis vertical, moving with the movements of the diaphragm, hard and irregular. On the right side there is noted a tumor of the same character but of slightly smaller size. Ureters not painful at any point.

Heart and lungs normal.

Liver does not appear to be enlarged at all.

*Nervous System.*—No apparent loss of reflexes or alteration of sensibility.

Thyroid not felt.

Skeleton and articulations negative.

Examination of the eye grounds showed slight congestion of the macula, dilatation of the papillary veins, but no edema.

December 15. In the morning there was violent delirium, the patient tried to get out of bed and all objects appeared to be deformed. Temperature 97.7, pulse 124. Chloral by rectum. In the evening the delirium continues with great restlessness. Temperature 98.3, pulse 120. At 6 P. M. 10 c.c. of cerebrospinal fluid were removed by lumbar puncture. The fluid did not seem to be under pressure and repose and a quiet night followed. Urine abundant with traces of albumin.

From the 16th to the 18th the patient did well, had little delirium but suffered greatly from headache. Urine abundant, traces of albumin.

December 19. In the morning violent delirium, nourishment refused, and it became necessary to feed through a tube. By lumbar puncture 12 c.c. of fluid was removed, clear and under no pressure.

After the 20th a daily improvement was noted, but the patient suffered constantly from headache and occasionally a little delirium was noted. Urine abundant with slight traces of albumin. On the 25th the delirium had entirely disappeared. The headache persisted. A salt free diet was permitted. Out of bed on the 26th. No albumin after December 31.

In the first few days of January we asked Dr. Monfrin to use the methylene blue test. This gave the following results: Injection at 3 P. M. January 10. Color appeared at 3.45. Maximum coloration from 4 to 4.30; from this time the color diminished until at 8 the next morning it had disappeared.

The examination of the blood and cerebrospinal fluid showed them to be perfectly normal. Histological examination of the liver and kidneys of the fetus showed nothing abnormal. Urine obtained just after birth by puncture of the fetal bladder contained a slight trace of albumin.

In concluding their case report Gilles and Ducuing, while acknowledging that their isolated experience does not permit of drawing any definite conclusions, express the opinion that this method of treat-

ment is worthy of consideration, "more especially as the method is simple, easy of execution, and absolutely harmless."

Espy Williams has recently reported the following case under the title "Intramammary Injections of Oxygen in the Treatment of Eclampsia:

II-para, twenty-seven years of age, postpartum eclampsia six hours after labor at term. When first seen coma was complete, pulse 140, temperature 102.5. Bladder contained 2 ounces of highly albuminous urine. Treatment: morphine and veratrum viride hypodermically, removal of 10 ounces of blood by venesection, purge of calomel and elaterium, hot packs, and proctoclysis with physiological salt solution. In addition, to quote: "Under strict aseptic precautions, and washed through a strongly phenolized solution, oxygen was introduced into each breast from an ordinary tank of the compressed gas. Each breast was completely filled, the gas finding its way into the thoracic areolar tissue and distending the parts as high as the clavicle. Each breast was then strapped down tightly and a figure of eight bandage applied over this. No massage was used. After institution of treatment there were two slight convulsions; the pulse fell to 60 (veratrum influence, I believe), the bowels moved in three hours; consciousness was regained in four hours; urine began to be plentifully secreted, and subsequent recovery was progressive and uneventful."

In conclusion Williams confesses a healthy skepticism as to the degree to which the blood supply of human breast may be cut off by means of distention with air or oxygen and wonders if there can be any direct action of the oxygen on the toxin. As he says the case is given for what it is worth, which from the viewpoint of the study of the efficacy of a treatment directed against a mammary toxin, is very little, because the efficiency of the other treatment.

In the recent symposium on eclampsia in the *Journal Medical Francais*, Lequeux, writing on the pathology, and Commandeur, writing on the treatment, have commented on the breast theory of the disease and the latter is willing that the injection of potassium iodide solution or oxygen should be tried tentatively. Santi, also, has contributed an interesting theoretical discussion of the subject, containing an excellent résumé of the knowledge of parturient paresis, and he seems to believe that the two diseases are closely allied if not identical conditions. So far as I know the mammary theory of eclampsia has received mention in only three text-books, namely those of DeLee, Hirst and Williams, in the last editions. Hirst and DeLee dismiss the subject with scant attention while Williams thinks that the work of Kastle and Healy ". . . . adds an experimental basis to Sellheim's apparently absurd suggestion."

3. COMPARISON OF PARTURIENT PARESIS AND ECLAMPSIA AND SOME  
CONCLUSIONS REGARDING THE POSSIBLE MAMMARY ORIGIN  
OF THE LATTER.

However skeptical one may wish to be regarding the mammary theory of eclampsia, the hypothesis is at least sufficiently plausible theoretically, and predicated upon facts enough to entitle it to a respectful consideration. Let us examine it, then, from the two viewpoints of theory and practice.

The one fact in connection with eclampsia which has not been subject to dispute and controversy is its obligatory relation to some stage of the gestational process. This entirely accepted fact has naturally resulted in giving an enormous impetus to the investigation directed toward the etiological incrimination of the fetus or placenta. As previously mentioned, Sellheim, has emphasized the fact that an important and much neglected phase of pregnancy and the puerperium, a phase certainly of sufficient importance to be given consideration in the study of so complex and obscure a disease process as eclampsia, is lactation, which is prepared for and to a certain extent started in the early part of pregnancy. The establishment of activity in a mass of previously quiescent glandular tissue of the size of the breasts, must of necessity be accompanied, it is reasonable to suppose, by some effect on the general metabolism; and it is easy to go further back than this and suppose some abnormality in the mechanism by which the mammary activity is initiated, which might conceivably determine an altered quality of the secretion, even to the point of toxicity. As pregnancy draws to a close it would seem reasonable to suppose that Sellheim is correct in believing that the metabolic strain on the mother must be increased by the addition of the ever increasing mammary metabolism to that of the placenta. After all, as far as the mother is concerned, birth does not mean such a startling change in her relations to her offspring, which is transformed simply from a uterine to a mammary fetus. After birth, for its assimilation and excretion, it must depend upon its own exertions, but nature intended that its food should still be elaborated for it by its mother, at no matter what strain on her metabolic activities. Certainly the hypothesis that milk or colostrum secretion may be a strain on the general metabolism does not seem too wild to be given consideration. It may be pointed out, also, that the two great toxic disturbances of pregnancy, toxemic hyperemesis and eclampsia, occur respectively, in the great majority of the cases, at the time when

breast activity is first to be noted or when it is reaching the acme of its preparation for the impending change in the method of nourishment for the fetus. This fact may be significant or a mere coincidence.

Practically considered, the mammary theory of eclampsia is predicated upon a few animal experiments and the striking similarity between the disease and parturient paresis of cattle. In the previous description of the latter condition, it has been shown that the consensus of the best veterinary opinion that the disease is a toxemia of mammary origin is probably correct. This being accepted, the question becomes, first, how close is the analogy between the two diseases, and second, have the results of an empirical treatment of eclampsia directed against a possible breast-formed poison been such as to lend weight to the theory or otherwise.

Eclampsia and parturient paresis certainly present some very striking similarities. Both are undoubtedly toxemias; the pathology of either one is inexplicable on any other hypothesis. Both have an obligatory association with some phase of the parturient process. Going no further than this we have statements which should attract attention. But clinically and pathologically the two conditions run closely parallel. Vague premonitory symptoms, convulsive attacks, and coma, such is the clinical progress of events in each. High blood pressure; albuminuria, associated with casts, blood, diminished urea, and changes in the nitrogen partition; varying temperature curves; all these are common symptoms. The pathology of eclampsia is better known and understood than anything in connection with it. The essential lesions are in the liver and consist of necrotic areas of liver parenchyma at the periphery of the lobules, in close association with thrombosis of and hemorrhage from the smaller portal vessels. Schmorl, Konstantinowitch, Opie, Williams, and many others regard these lesions as absolutely pathognomic. Occasionally large hemorrhagic extravasations under the tissue of Glisson's capsule have been noted. The lesion of the kidneys is an acute degenerative nephritis, spending its force on the epithelium of the tubules. In the heart and other viscera are evidences of more or less parenchymatous degeneration. Various changes are described in the brain none of which seems characteristic, but hemorrhages are not found infrequently. Knowledge of the pathology of parturient paresis is as nothing compared with that of eclampsia, but what we do know, based largely on the autopsies of Delmer, quoted above, is striking enough in its similarity. It is not too much to say that the hepatic lesions are practically

identical. If anything, the hemorrhagic tendency seems more pronounced and the process seems to extend further toward the center of the lobule. In ten cases two large subcapsular hematomas were noted. The kidney lesions are absolutely identical. Hemorrhages are noted in the central nervous system. The heart and other viscera present evidence of acute parenchymatous degeneration. Pathologically, certainly, the two diseases run as closely parallel as possible.

There are certain differences between the two diseases which, if not as striking as their points of similarity, should, nevertheless, receive careful consideration. The first of these is a serious one. There can be no doubt that parturient paresis has a very close association etiologically with development along lines of milk production. So pronounced is this that the history of an attack of so-called milk fever adds greatly to the value of a cow in the eyes of a prospective purchaser. In the case of eclampsia, the disease is certainly not seen with any undue frequency in women who prove to be good nurses, or the fact would have attracted attention. On the other hand, it may be safely said that eclampsia usually fails to inhibit lactation to the extent which might be anticipated in the case of such a serious and dangerous malady. In a recent case of my own, after a desperate attack of postpartum eclampsia, the patient proved to be an unusually good nurse, and at nine months of age the baby weighed over 22 pounds. In the second place primiparity markedly predisposes to the human disease, while it confers an almost complete immunity to the cow. This difference is difficult of explanation. Thirdly, eclampsia occurs postpartum in from one-fifth to one-third of the cases, whereas parturient paresis is almost entirely a postpartum condition, certainly in over 90 per cent. of the cases. Finally we have in the bovine disease the practically constant presence of large amounts of sugar in the urine. The kind of sugar, so far as I know, has not been definitely determined, but sugar in any form is a rare constituent of eclamptic urine. It is, of course, impossible to say how much importance, if any, should be attached to these obvious differences in the two diseases. An authentically identical disease might well, in human and bovine environment, present great clinical variations and judgment on this point must be reserved for greater knowledge.

The experiments of Kastle and Healy with guinea-pigs, and of Delmer with cows, show rather conclusively the toxic character of the colostrum from cases of parturient paresis. The lesions found at autopsy on the pigs used by the former are certainly very similar

to those of human eclampsia. I have been unable to find the report of any experimental work on the toxicity or nontoxicity of colostrum from cases of eclampsia. The literature, particularly recently, contains, however, several articles bearing on the toxicity for the nursing of the colostrum or milk of eclamptics and advocating that such patients should be prohibited from nursing their babies.

It is impossible to draw conclusions of value from the collected cases of eclampsia in which in varying ways the attempt has been made to limit absorption from the breast. The cases only number twenty-nine, and this number includes seventeen cases of Bolle, concerning which there are no clinical data except that two were moribund at the time that treatment was begun. Of the remaining twelve cases those of Sellheim, Martin, Herrenschneider, and Gilles and Ducuing are of the greatest interest. Statistically, of course, they show nothing. Yet in all but one of the six cases reported by the authors mentioned, there seems to be a reasonable basis for the belief expressed by them, that the treatment did result in an immediate improvement in the patient's condition. Certainly no case could be more desperate than the two in which Sellheim and Herrenschneider resorted to amputation of the breasts. Whether the improvement noted proves to have been *post hoc* or *propter hoc* remains to be seen.

Finally, and in conclusion, I would present the following points for consideration:

1. Parturient paresis is a disease of the parturient cow, undoubtedly due to the circulation in the blood of a powerful toxin having its origin in some perversion of the mammary secretion.

2. The mammary theory of eclampsia is based almost entirely on the practically complete pathological and clinical similarity of the two diseases.

3. There are, however, the following important differences:

- (a) Parturient paresis rarely attacks primiparous animals, while primiparity markedly predisposes to eclampsia.

- (b) Parturient paresis occurs almost entirely postpartum; eclampsia shows no special predilection for this period.

- (c) Parturient paresis increases in frequency in direct ratio with increased power in milk production. No such finding has been noted in eclampsia.

- (d) Sugar is an almost constant ingredient of the urine of parturient paresis but is rarely found in eclamptic urine.

4. The mammary theory of eclampsia is probably merely specious. At the same time it deserves careful and thorough investigation and



offers an attractive field for study. At least, it may prove to be the explanation for the occurrence of a small proportion of cases.

5. Such an investigation should include:

(a) A careful pathological and clinical study of parturient paresis.

(b) The determination of the toxic or nontoxic character of the colostrum from eclamptics.

(c) A tentative trial, in properly selected cases of eclampsia, of the treatment by air or oxygen injection of the breasts, which at least has the undoubted advantage of being harmless.

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## X-RAY TREATMENT OF UTERINE FIBROIDS, MENORRHAGIA AND METRORRHAGIA.\*

BY

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ROENTGEN-RAY treatment of uterine fibroids, menorrhagia and metrorrhagia, although still more or less in the experimental stage, has already shown sufficiently satisfactory results to justify our giving it serious consideration in the treatment of these cases.

It is somewhat difficult to trace the origin of the treatment. There are several isolated cases reported as far back as 1905, but the subject has only been given earnest attention for the last four or five years.

During this time thousands of cases have been treated, chiefly abroad, with a large percentage of very gratifying results.

It was in the latter part of 1911 that, at Dr. Brettauer's and Dr. Frank's request, we began the treatment of these cases in the Radiotherapy Department of the Mt. Sinai Hospital, and the object of this paper is to report the results we have accomplished up to date.

Altogether we have treated fifty-two cases, thirty-three of which were treated at the hospital and nineteen in private practice.

Among these were twenty-nine cases of uterine fibroids and twenty-three cases of menorrhagia and metrorrhagia.

The class of cases chosen were chiefly of the more severe type, that is cases which had been under treatment for a number of years, most of them cureted once, or more often, without lasting relief.

Several of them were suffering from various forms of heart lesions, which made radical surgical interference a practical impossibility.

To illustrate the class of cases treated, and some of the results obtained, I will describe a few of them briefly:

\*Read at a meeting of "The Medical Society of the County of New York," April 21, 1913.

CASE I.—*Mrs. I. R. S. Multiple Fibroids.* Referred to me by Dr. Brettauer in January, 1912, thirty-two years old, married ten years, one child eight years old. Began to menstruate at fifteen, fairly regular up to marriage. Then menstruation became much more profuse, lasting about ten days, five of which she was compelled to stay in bed.

After birth of child, menstruation was somewhat less for a while, when it became severe again. At this time she was cureted, with improvement for a little while.

In 1909 she became pregnant, in third month began to bleed, was put to bed for three weeks, but miscarriage could not be avoided. After this, patient menstruated every three weeks, extremely profusely, lasting ten days or more, six of which she had to stay in bed.

Last menstruation January 15. X-ray treatment began February 1, 1912. Patient extremely anemic and felt very weak.

*February.*—Had four treatments up to seventh, when she began to menstruate, lasted seven days, decided improvement on previous menstruation.

*March.*—Began to menstruate on March 11 (five days late) fairly profuse for three days, mild flow for four days (twelve treatments).

*April.*—Began to menstruate on April 8 (on time), fair flow for two days, very little for four days—no clots at any time—(nineteen treatments).

*May.*—Began to menstruate on May 5 (on time) lasting six days—mild flow (twenty-four treatments).

*June.*—Began to menstruate June 2 (on time) lasting five days—normal.

*July.*—Menstruation same as that of June.

*August.*—Menstruation was eighteen days late—lasted five days—normal (thirty-four treatments).

At this time treatments were discontinued. Dr. Brettauer, on examination, found a very decided improvement in the patient's condition.

Patient menstruated normally up to November, when menstruation ceased.

Dr. Brettauer, on examination in March, 1913, found that she was about four or four and one-half months pregnant.

General condition of patient very good.

This is a most interesting and instructive case, not only on account of the improvement in the patient's condition but, when we consider that this patient had thirty-four x-ray treatments, covering a period of six months and according to our conception of the sterilizing power of the rays, sufficient to sterilize her for a long time, we find her, four months after discontinuing treatments, becoming pregnant.

The last time she conceived before treatments were begun, she miscarried the third month, she is now probably in the fifth month, feeling very well.

It will be interesting to see whether she goes to full term, and whether there will be any difficulty in delivery.

CASE II.—*Mrs. J. B. Uterine Fibroids.* Referred by Dr. Frank, February, 1912. Thirty-eight years old, married fifteen years, fairly regular up to birth of first child; after this she began to menstruate every twenty-three days, lasting five or six days, but extremely profuse. Had to stay in bed during entire time; was cureted three times, with very little benefit, in fact after last curetage condition was worse. Last menstruation February 12.

*March.*—Began to menstruate March 10, very much like last menstruation, but three days later. Had five treatments.

*April.*—Began to menstruate April 6 (twenty-seven days) lasted four days, less clots than previous menstruation. Had twelve treatments.

*May.*—Began to menstruate May 2 (seventeen days late) very much like last menstruation, but even less clots; patient was not compelled to go to bed.

*June.*—Treatment discontinued. Had twenty-five treatments in all.

*March, 1913.*—Patient did not menstruate for about six months. Has been very well, with the exception of occasional slight flushes. Menstruation reestablished in December, normal. Dr. Frank finds that, with the cessation of menstruation, the uterus greatly diminished in size, and the multiple fibroids which had been the size of large marbles could no longer be felt. With the reestablishment of menstruation the uterus has again enlarged somewhat, and the fibroids are just palpable.

This patient showed a very interesting improvement in another respect, she had been extremely constipated ever since she remembers, compelled to take cathartics continually. During the time she was receiving x-ray treatments this condition became very much improved. At no time did she have to take any cathartics. This we have found in several of the cases treated.

CASE III.—*Mrs. C. B. Uterine Fibroids.* Referred by Dr. Brettauer, February, 1912. Forty-three years, married twenty-two years, four children.

Began to menstruate at thirteen, fairly regular up to one year ago, then began to menstruate every three weeks, lasting ten to twelve days, very profuse. Last menstruation began about three months ago, has persisted with various degrees of severity up to a few days ago. Still some spotting present. This stopped after the first treatment.

*February.*—Began to menstruate on February 21, very little for two days, more profuse for the following two days, stopped the fifth day. Had three treatments.

*March.*—Began to menstruate on March 18 (on time), lasted five days, moderate flow, had ten treatments. After this patient menstruated every four weeks, lasting five days, normal. Treatment was continued up to July. Patient had thirty treatments in

all. Dr. Brettauer, on examination at this time, found decided improvement in patient's condition.

*March, 1913.*—Eight months after treatments have been discontinued, patient reports that improvement has persisted, and that menstruation has been perfectly normal.

Dr. Brettauer, on examination at this time, reports that although there is a decided improvement apparent in the patient's general condition, the size of the fibroid is just about the same as when treatments were begun.

This is a very interesting case, as the patient bled for three months continually before treatment was begun, and improvement showed practically after the first treatment. This improvement has persisted up to date, for more than thirteen months, although the size of the fibroid has apparently not been diminished whatever.

*CASE IV.—Mrs. M. H. Uterine Fibroid.* Referred by Dr. Rubin in August, 1912. Thirty-four years old. Patient gave a history of very irregular and profuse menstruation, dating back for some years.

This patient began to show improvement very shortly after treatments were begun. This has persisted up to date, at present menstruation is practically normal, and on examination in March, Dr. Rubin found that the fibroid, which originally was the size of a large fetal head, had diminished to the size of a small orange.

This case is interesting inasmuch as the improvement showed so promptly, and on account of the great diminution in the size of the fibroid.

We have found that the number of treatments necessary to show the beginning of any improvement varied a great deal. Some began to show improvement shortly after treatments were begun, while others would show very little change for several menstruations, and required a few series of treatments before improvement was noticeable.

The first improvement noticed in the majority of cases was the lengthening of the intermenstrual period.

Patients who menstruated every three weeks would begin to menstruate every four weeks, and often go to five or six weeks, perhaps even longer.

The next symptom to yield is generally the amount of pelvic pain, and the spotting that these patients so often have.

This is followed by a diminution in the amount of menstrual flow, and the lessening of the number of clots passed, and finally the length of the menstrual period is shortened.

Of course there were cases where the improvement was very little, and some where there was no improvement whatever, but in the great majority of cases there was some improvement where the

patients persisted with treatment for a sufficient length of time (a few months).

Probably most fibroid cases that showed little or no improvement were of the submucous variety. It is barely possible that later, with a more improved technic of administration, perhaps larger dosage and more prolonged treatments, we will get better results in these cases.

In the majority of cases the improvement was such that the patients considered themselves perfectly well, and this improvement has persisted up to date with a few exceptions.

There were in all two or three cases where we noticed some tendency to a recurrence, but in no case was this recurrence as bad as the original condition.

In one case, referred by Dr. Vineberg, a patient with a fibroma and a mitral lesion, which made an operation dangerous, the bleeding, which was very profuse, lasting for weeks, was promptly checked.

This patient occasionally gets slight recurrences of bleeding and spotting, but not very serious, and I think, with persistence, we will succeed in producing a permanent menopause, which will probably alleviate her symptoms.

We have produced menopause in a number of the patients treated who were near the climacteric period.

In a number of younger women, we have seen a temporary menopause, lasting six to eight months, always with a reestablishment of menstruation in a normal way.

No permanent menopause has been seen by us in patients under forty years of age.

As regards producing sterility in patients treated, as Case I shows, this is a very uncertain matter.

I believe there is a temporary sterility produced, which lasts (unless treatments have been very excessive) not more than six months or a year.

In this respect I believe we can compare the action of the rays upon the ovaries to that on the testicles. Here I have found that in cases of necrostermia produced with the rays, the spermatozoa would frequently regain their motility as early as three months after treatments have been discontinued, and even in cases of complete azostermia we can often demonstrate the presence of active spermatozoa within one year after treatments have been stopped (unless there has been an actual atrophy of the gland produced).

A very interesting case was referred to me by Dr. Pascal:

CASE V.—*Miss M. P. Submucous Uterine Fibroids.* Sixteen



years old, began to menstruate at twelve, was regular for one year, when she bled from July to September. Has been very irregular ever since as regards time and length of flow, which several times lasted three weeks or more. Patient was curetted twice. At the last curetage Dr. Pascal felt decided irregularities in the fundus, which made him feel quite sure that the bleeding was due to multiple submucous fibroids. X-ray treatments were begun October 16, 1912.

*November.*—Began to menstruate on November 2, lasted about three days, very moderate flow. Following menstruations were on November 29 and December 28, neither one lasting more than three days, with very slight flow. The next menstruation was about three weeks late, and lasted for eight days, but very scanty.

General condition of patient is very much improved; the anemia, which was marked at the beginning of treatment, has entirely disappeared. The March menstruation was a few days delayed, lasted about six days, very slight flow. Treatments have been discontinued. The April menstruation lasted six days, perfectly normal.

This patient was the youngest I have treated. While it is entirely too early to speak of a permanent cure in this case, it is, nevertheless, a very gratifying result, when we consider the patient's age, the fact that she has been curetted twice, and has taken large doses of ergot, without much benefit.

I realize that none of the cases have really stood the test of time, as the oldest one we had was not more than eighteen months ago, but foreign observers who have done this work for a number of years found that the improvement was generally of a lasting character.

I shall not waste any more time in going into the history of the other cases.

Our results in menorrhagia and metrorrhagia were very similar to those in the fibroid cases.

In one case of menorrhagia referred to us by Dr. Frank, a young girl who bled profusely for three months, and who was curetted twice without benefit, the bleeding stopped after a few treatments.

Patient had sixteen treatments between February and June, 1912, when they were discontinued.

She reported in March, 1913, that she has been perfectly regular up to that time (eight months).

In these cases probably fewer treatments are necessary, and the treatments need not be kept up quite such a length of time.

In cases of menorrhagia and metrorrhagia which do not yield to treatment we must keep in mind the possibility of submucous fibroids being present.

Such was a case referred by Dr. Frank, *S. R.*, a young woman whom we treated for a supposed menorrhagia for some months, without relief.

On referring her back to Dr. Frank, he discovered that she had a small submucous fibroid in the fundus, after the removal of which all her irregularities disappeared.

The method by which the *x-ray* produces its beneficial effect in these cases is still somewhat indefinite.

We know that the *x-ray* affects tissues according to their degree of cellular development. For this reason its most powerful action is on glandular tissue, and the higher the development of the glands the more easily are they affected by the rays. So we find that the testicles and the ovaries are perhaps the most easily affected of all glands.

The ovaries have a very powerful influence on the menstrual flow, and the *x-ray* probably accomplishes its object through a reflex action on these glands.

There may also be some slight effect upon the vasoconstrictor nerve supply of the uterine organs directly.

The method of *x-ray* administration in these cases is very important, and I have no doubt that many failures can be attributed to a faulty technic.

The tubes used must be of a high degree of vacuum, measuring from 10 to 12 on a Benoist radiometer, backing up at least an 8-inch spark, but not more than 9 or 10 inches.

We must keep in mind that in *x-ray* therapy the rays that have the most therapeutic value in a given case are those that are absorbed by the tissues we are trying to influence.

The carrying out of this principle is the most important one in successful *x-ray* therapy.

The rays emanating from an *x-ray* tube are not all of one penetration; they are of various degrees, some are absorbed by the skin, others by the superficial tissues, others again by the deep seated tissues, while a considerable portion passes out through the body.

Our aim must be to regulate the vacuum of the tube to such a degree that most of the rays will be absorbed by the uterine organs.

The soft rays, which are the ones that chiefly produce radiodermatitis, must be carefully filtered out in the treatment of these cases.

This can be done in various ways, such as using aluminum filters of different thicknesses, or by using dry or wet leather of various degrees of absorption. The method that we have used (this I believe

to be original in the treatment of these cases) is to use finely chopped ice, wrapped in absorbent cotton, covered with a thin layer of rubber tissue.

This answers a double purpose—it acts as a splendid filter to the soft rays, and in addition, chills the part, making it less amenable to the development of a dermatitis, and enabling us to give considerably larger doses of x-rays without any danger.

It has been found by various observers (de Keating, Hart and others) that the susceptibility of tissues to the influence of x-rays is in direct ratio to the amount of heat in the tissues. For this reason inflammatory tissue is much more susceptible to the development of x-ray dermatitis, and the colder the tissue the less this susceptibility.

This method of filtering has proven very satisfactory, and since we began using it we have not had a single instance of even a first degree dermatitis in any of these cases.

Our *modus operandi* is as follows: The patient is put in a reclining position, with the pelvic area exposed, and the legs hanging down, in order to put the abdomen on a stretch.

If there is a lot of fat on the abdomen the patient is directed to take both hands and roll up the fat towards the umbilicus, and keep it in this position during the treatment.

The cotton ice-bag is put on the pelvis from about 1 1/2 inch below the pubic spine to about 4 inches above it, almost entirely across the abdomen.

The patient is covered with a thick rubber matting in which an opening has been made to correspond to the size of the ice-bag.

The tube is placed about 8 inches from the skin alternately (on different treatment days) a little to the left or right side of the median line.

The amount of x-ray administered at each treatment should correspond to about 2 H. on a Holzkecht radiometer.

This can either be measured each time, or a standard established and repeated.

The standard can be established by carefully noting the length of time necessary to produce 2 H. with a machine under certain set conditions.

The chief things to be considered are the degree of vacuum, distance of tube from the patient, amperage to the primary coil, milliamperes going through the tube, and the uniform working of the interruptor.

The frequency of the treatments depends a great deal upon the severity of the case, and what we are trying to accomplish.

Where the patient is near the menopause age our aim is to hasten this, so we may give the treatment more frequently than in younger women, where the bringing on of the menopause is to be avoided.

Also where we have a great loss of blood which must be checked, more frequent treatments are indicated.

The treatment for younger women (under forty years) is best divided into series.

The first series would be a treatment every third day until the patient had six treatments, or until menstruation begins.

The second series begins after menstruation stops, and consists of two treatments a week, for three weeks.

The third series is like the second.

The fourth series is one treatment a week for three weeks.

The fifth series (if necessary) is the same as the fourth.

In the majority of cases treatments may now be discontinued.

Cases in which there is no improvement at this time had better be referred back to the surgeon, or, if inoperable, discontinue treatments for about two or three months, and start over again.

While these treatments add up to considerably more than an erythema dose—on account of the high vacuum tube used, the filtering of the ray, the chilling of the skin and the intervals of rest between treatments—there is practically no danger of developing a dermatitis.

In patients in whom we are trying to establish a menopause, treatments may be kept up in series of three weeks at the rate of two or even three a week indefinitely, that is until the menopause has set in.

While it is desirable to stop treatments during the menstrual period, if the bleeding is protracted (more than a week) and there is only a slight flow or spotting, there is no objection to resuming treatment again.

In closing, I think we may summarize the present standing of radiotherapy in the treatment of uterine fibroids, menorrhagia and metrorrhagia, as follows:

X-ray therapy is gradually assuming an important place in the treatment of uterine fibroids, menorrhagia, and metrorrhagia.

It is by no means a cure-all; a large percentage of cases can be cured, some benefited by the treatment, but there are cases where it will fail, despite careful and energetic persistence.

Improvement under treatment occasionally does not begin until

the fourth or even the fifth month, and no case should be discarded as unyielding until it has been under treatment for that length of time.

The percentage of cures will depend upon the proper technic of administration and upon the selection of the cases; it is perhaps of least value in cases of submucous fibroids (although occasionally here we also get good results—Case V).

The treatment in no way interferes with any other treatment that may be subsequently resorted to in case of a failure.

With proper technic there is no danger whatever of producing an x-ray dermatitis in these cases.

There is practically no danger of producing a permanent menopause in women who are not near the climacteric period.

Temporary menopause occasionally occurs in younger women, lasting in some of our cases more than eight months, followed by a reestablishment of menstruation generally in a normal way.

The sterility produced by the treatment is not permanent, and probably rarely persists more than six months after treatments are discontinued.

In finishing, I wish to express my thanks to Dr. Brettauer and to Dr. Frank, who so kindly cooperated with me in the treatment of these cases, and helped me with their valuable suggestions.

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## SARCOMA OF OMENTUM.<sup>1</sup>

BY

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A SARCOMATOUS growth located primarily in the omentum is somewhat of a rarity. Most text-books do not refer to it, and some authors even deny that sarcoma is ever found as a primary affection in the omentum, but claim it to be secondary to that in the peritoneum. This, however, is not well taken, as the few cases recorded are sufficient to substantiate its existence as a primary growth. The omentum as a structure has afforded material for numerous investigations and research work.

Hadra (*Annals of Surgery*, 1891) states the following:

1. It serves as a protective padding to the abdominal cavity from forces from without.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

2. It protects the peritoneal cavity from infection from diseased points within. Thus, omental adhesions will be found wherever there are pathogenic germs setting up trouble.

Rubin on "Functions of Great Omentum" (*Sury. Gyn. and Obst.*, 1911) claims that the omentum has no spontaneous motility, that all displacements may be explained as follows: (a) intestinal peristalsis, (b) intraabdominal tension, (c) static conditions of stomach, colon and small intestine, and (d) its anatomic relations to gall-bladder and spleen. Furthermore, he states that the omentum has no demonstrable chemotaxis. It cannot restore vitality to necrotic organs, nor give any vascular supply to those deprived of their circulation. The usefulness of the omentum in inflammatory lesions of abdomen depends upon its power to form adhesions which isolate and render innocuous toxic products or destroying them by virtue of its phagocytic elements. But when contrasted with the sequelæ, intestinal obstruction and pain, its beneficence is overbalanced. Its chief functions are those of any other mesentery, namely, to fix the viscera and to aid in vascular supply.

The omentum is capable of absorbing large quantities of fluid and particles in suspension. As to grafting, those who have done work along this line warn us, that we must not expect too much from this procedure, that if any portion be detached, it soon becomes necrotic and is followed by disastrous results.

However, we find by searching the literature that omental grafting has been tried many times and that it has attached itself to serous structures, the proof being formed by reopening the abdomen. At this point, I present the following case for your consideration.

Mr. B., a baker by trade, had a small left inguinal hernia for a number of years which gave him little or no trouble, as he wore a well-fitting truss. He claims that on lifting a barrel of flour he felt something give way, had some pain at seat of rupture and found he could not replace mass as readily as he formerly did, and that it was much larger, now being the size of an egg. The truss was still worn over the rupture site, but there was now always some pain and so he consulted his physician Dr. Gould of Bellevue, Kentucky, who advised operation. This was not consented to and it was only upon the growth becoming much larger, that at last (after a period of two months from the time of first consultation) he finally consented to operation and then it was that I first saw him.

Patient was aged thirty-two, of fleshy build, 5 feet 5 inches in height and weighed 210 pounds. Had had the usual sicknesses of



childhood, but since then has been perfectly well (with the exception of rupture) up to three months ago. He consulted his physician on account of pain, an increase in size of scrotal tumor, at times nausea, some loss of appetite, constipation and an inability to perform his usual vocation with his wonted energy. Had lost in weight about 40 pounds and as he expressed it, felt at times miserable. Upon examination I found an inguinoscrotal mass on left side, size of a cocoanut, somewhat tender to pressure and slightly edematous. The hernial mass for the past four weeks could not be returned to the abdominal cavity and seemed to be constantly increasing in size.

Patient sent to Bethesda Hospital and operated April 18, 1911. On opening sac I came upon a peculiar looking vascular mass, bathed in a bloody serum. The mass proved to be omentum having testicle and cord imbedded in it, and about two inches of pale flaccid small intestine. The sac was mopped dry, intestines separated, and traction made on omental mass with the idea of ligating it at suitable points, if a normal omental structure could be reached. There seemed to be something peculiar above, fastening it to upper part of hernial canal. The entire canal was then opened up where I could get a good view into abdominal cavity, and I found masses of paraffin surrounding the opening and quite a mass in the abdominal cavity. I later found upon further questioning that patient had two years previously consulted a so-called specialist, who must have injected at least a pint of paraffin to cure this hernia. This fact was not stated to me on taking his history. Some of the paraffin was removed, three or four masses the size of a small lemon, omentum now dragged down and out of abdominal cavity and ligated, removing at least half of omental structure. The cord and testicle were also removed. Operation completed, scrotal sac drained, and patient returned to bed in good condition. Tumor mass examined by Dr. Gould and pronounced round-celled sarcoma. Pathologist to Bethesda Hospital gave report a few days later, also pronouncing it round-celled sarcoma. The portion of cord and testicle removed was found to be normal. Considering the clinical history as obtained and the microscopical report, this case is so submitted. Patient left hospital in three weeks and attended to business for a period of sixteen months, when he again consulted various physicians for intermittent severe pain, loss of weight and general weakness. He consulted me just before I left for my vacation when upon examination I found a large mass in left side of the abdomen, a partial giving away of hernial sac allowing some protrusion, and weight now had reached 160, making a loss altogether of 50 pounds. Pain almost constant and was so severe at times that he could not attend to his business, and had to have repeated hypodermics of morphine. I advised a second operation but have not seen patient since my return from vacation. I am not able to find another like case (that is, an omental carcinoma incarcerated in a scrotal sac) in

literature, and the subsequent history proves conclusively that it was a primary growth. It is naturally questionable, the rôle the paraffin injections played as to being a starting factor, by the trauma induced at the time of injection, and its presence as a foreign body, interfering with circulation and retaining omentum in this abnormal cavity.

Tilanus (*Annals of Surgery*, 1890) tried some very interesting experiments by attempting to inoculate sarcoma and carcinoma, but was not successful.

Baxter (*Annals of Surgery*, 1894) found that the omentum was subject to the same changes as the intestine, when dealing with hernial tumors. The bowel has the constant tendency to return to the abdominal cavity by its alternating emptiness and fullness.

The omentum normally is spread over the surface of the small intestines, but it is remarkable how it becomes displaced, rolled up, adherent and even enters other parts of body. Whenever the omentum becomes twisted, symptoms likened to those of intestinal obstructions occur. A strange phenonema and sometimes unexplainable is the presence in the hernial sac of the different organs of body, the pancreas having the distinction of being the only one from the abdominal cavity which has never been found in this locality. The frequency of omentum in hernial sacs is well known.

Mayall in 283 cases of inguinoscrotal hernia, found intestine in 149, omentum in seventy-seven, and both present forty-seven times.

However, it is also well known that this relative proportion varies with the duration and size of the hernia. In early stages the omentum enters the sac, but when the opening becomes large enough the intestine forces its way in, this accounting no doubt for the different statistics as to varieties. Mayall found that the large intestine entered hernial sac in about the following ratio, twenty-two out of 443 cases, and of these eleven were cecal.

Time will not permit a review of the origin, clinical characters, varieties and changes of sarcomatous growths, other than to say, that this most malignant growth when met with, is usually disastrous. The opportunity for curing it, if this can be accomplished, is mainly by surgery, and the serum treatment is yet in its infancy, but promises much.

Bull (*Annals of Surgery*, 1893) called special attention to the dangers which may arise in removing portions of the omentum. He says they are:

1. Bleeding from an inefficient ligature.
2. Damage to neighboring intestine from a faulty application of ligature.
3. Danger of inflammation and abscess in omental stump when careless or faulty technic is practised.

Bonamy (*Revue de Gynecologie*, January, 1908) reports a case of primary sarcoma of omentum. He says, "I add another to the fifteen cases now on record" and summarize as follows: Only five survived one year in twelve operative cases. That sarcoma is very vascular and operative shock is very severe. The growth is usually located in the median line, it then develops rapidly downward, pushing down the genital organs. Infusion into the abdominal cavity is inclined to be hemorrhagic, and the course of the usual case is one year.

I find a most excellent paper on omental sarcoma by Farrar Cobb (*Annals of Surgery*, 1906) in which he reports an interesting case. Patient, age fifty-one, with gastric symptoms, malaise, loss of weight, constipation alternating with diarrhea and at times dark and bloody stools, vague abdominal pains, but at no time any febrile reaction and an abdominal tumor found at examination. On operating, tumor was found to be a solid mass of large, round cells. I found, looking through literature, some additional cases, but these I find to have been collected by Cobb so I quote from his paper.

Matas (*Trans. A. S. Ass.*, 1899). Male, age forty-six, primary sarcoma of great omentum. Not able to remove all of disease at first operation. Patient did not survive a second operation made one year later. Diagnosis of growth—myxosarcoma.

Braun of Jena (*Deutsch. Zeitsch. für Chir.*, 1885), a case of myxosarcoma of omentum. This case was supposed to be the first where a careful microscopic examination of mass was made.

Czerny reports a similar tumor in a male, age twenty-seven.

Braun in his search of the literature could only find reports of three cases before 1885, those by Simon, Pean and Witzel, Pean's case being a large omental hemorrhagic cyst.

Eve (*Trans. Pathological Society*, London, 1885-6) reports two cases, one by Lawson Tait and one by Sir Spencer Wells.

Reamy (*Trans. A. G. Ass.*, 1883) reports a case of omental cyst with sarcomatous walls.

Segoud (*Bull. et. Mem. Soc. de. Chir. de. Paris*, 1893) reports a like case.

Gross and Sencert (*Rev. de Gynecol. et Chir. Abdom.*, Paris,

1904). Female, age forty-three. Tumor originated in lesser omentum and gradually found its way into greater omentum by pushing down the transverse colon.

Gould (*Med.-Chirurgical Trans.*, London, 1900), a case of sarcoma of gastrohepatic omentum. Male, age thirty-eight, mass produced great displacement of stomach and intestines. Tumor was removed and patient lived four years.

Douglass (*Surgical Diseases of Abdomen*, page 703) a case of myxosarcoma of great omentum and autopsy revealed it to be a primary growth.

Anders (*Med. News, Phil.*, 1891). Male thirty-five, with a probable primary sarcoma. Autopsy revealed a secondary growth in liver. The first mass to appear was found in abdomen, there being no evidence of diseased liver until shortly before death.

Rochford (*Northwestern Lancet*, Minneapolis, 1904). Female, age thirty-seven, operation, spindle-cell sarcoma found. Patient had had tumor over a period of four years.

Schmidlechner (*Pester Med. Chir. Pressc*, Budapest, 1904). Patient, woman, age forty-eight. Tumor noticed for period of one year. Operation, a spindle-cell growth found.

Chiarleoni (*L. O. No. of Avon Univ. di Med. E. Chir.*, Milano, 1886) reports a case.

Braidwood (*British Med. J.*, 1876). Female, forty-six, no operation. At autopsy spindle-cell mass found.

Launenstein (*Encyklops. d. ges. Chirurgie*, Leipsig, 1903) reports a case which died of gastric hemorrhage following operation. He states, that Friedrich has experimented on dogs and guinea-pigs in relation to this hemorrhage, and found that resection of omentum was liable to cause ulcers in stomach, duodenum, and multiple hemorrhagic and necrotic areas in the liver, therefore, he advised great care in handling and removing the omentum.

Reviewing the above very incomplete reports, I find twenty-two cases reported and as Bonamy's paper appeared in 1908, he must have included his fifteen cases among this number. Ages given only in nine cases as, thirty-two, thirty-five, thirty-five, thirty-seven, thirty-eight, forty-three, forty-six, forty-eight, and fifty-one, average thirty-nine. Sex mentioned in only eight cases, five males and three females. Results, some survived operation living up to one year, one to four years and that of mine of one and one-half years standing.

19 WEST SEVENTH STREET.

"THE NEWER OPERATIONS FOR RESTORATION OF THE  
 PELVIC FLOOR WITH AN ORIGINAL TECHNIC FOR  
 EXPOSING AND UNITING THE INJURED LE-  
 VATOIRES ANI AND DEEP TRANSVERSUS  
 PERINEI MUSCLES."

BY

BARTON COOKE HIRST, M. D.,

Philadelphia, Pa.

(With Nine Illustrations.)

AFTER a trial extending over twenty-five years, of the various methods of perineorrhaphies, posterior colporrhaphies and myorrhaphies of the pelvic floor, the writer believes that objections can be found to all of them, and that it is still possible to devise what might be described as the ideal method of restoring the pelvic floor *ad integram* by the direct union of all the muscles involved, at the site of their original injury.

This can be done by a further modification and extension of that form of pelvic myorrhaphy which began with Lawson Tait's flap-splitting perineorrhaphy and has lately been developed by many operators in different parts of the world into a deliberate exposure and junction of the levators and deep transverse perineal muscles by a transverse incision of the perineum and a deep dissection of the space between the vagina and the rectum.

This operation, however, as now performed, has two defects. In the first place, many surgeons are joining the deep transverse perineal muscle in mistake for the levators, missing the latter altogether. In the second place, if this mistake is avoided, the two halves of the levators are pulled together in the middle line, ignoring the fact that they are, in part, or altogether, detached from their original attachment to the ischium and pubis; thus making a sort of muscular tampon between the vagina and rectum without bony attachment or with only a part of its original attachment to the pelvic walls.

This procedure is well illustrated in the last edition of Döderlein's and Krönig's book. It is obviously not an ideal method of repair. The result is unanatomical and does not give the pelvic floor its original support.

If numbers of women are examined at all periods after labor, it

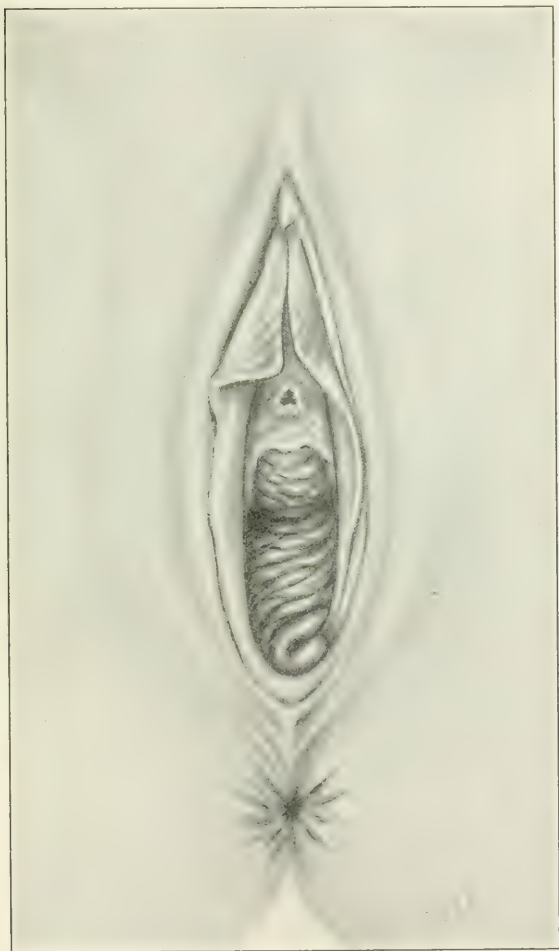


FIG. 1.



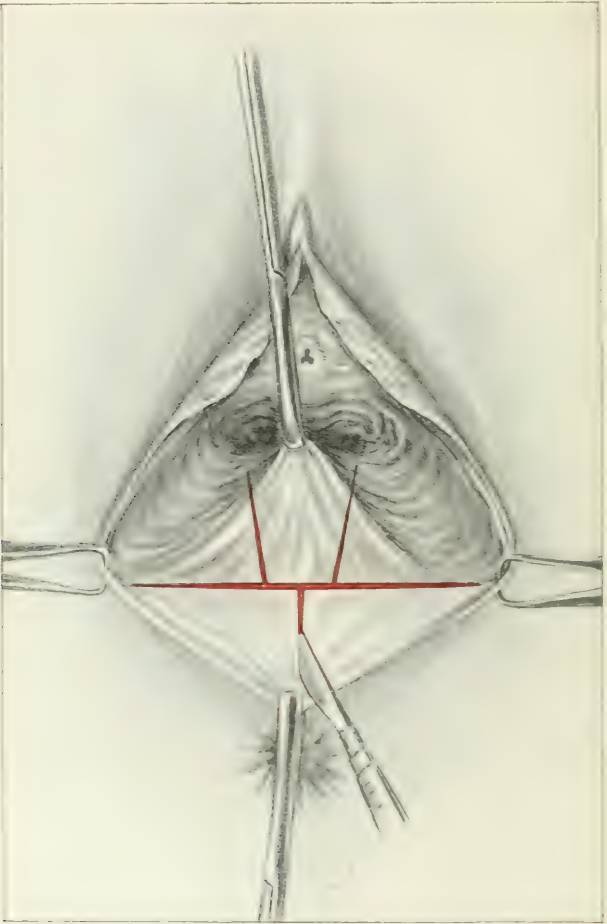


FIG. 2



FIG. 3.

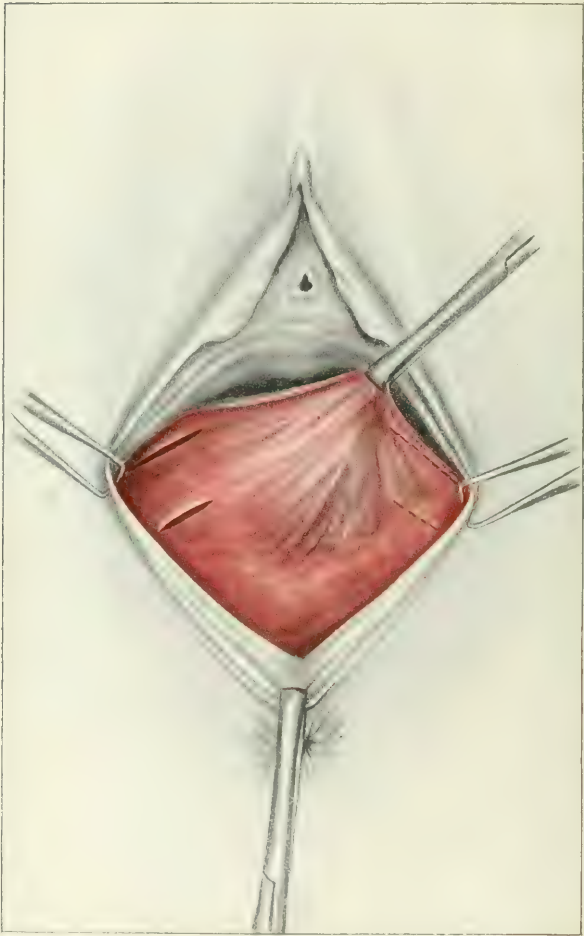


FIG. 4.

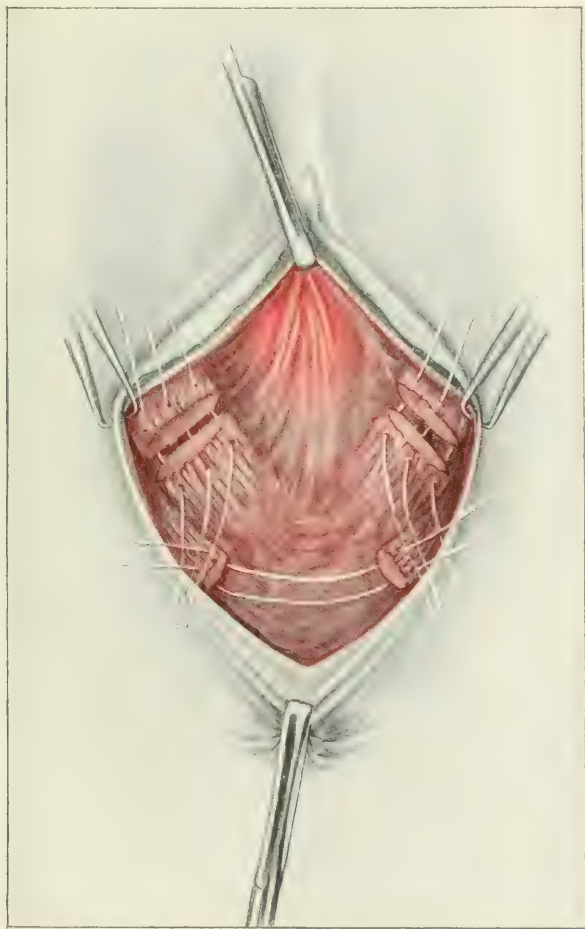


FIG. 5.



FIG. 6.

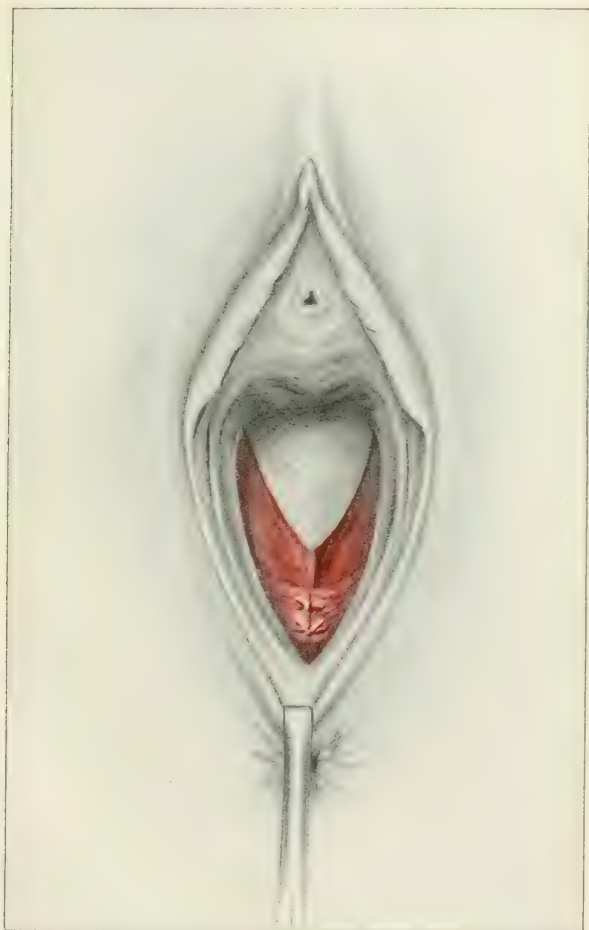


FIG. 7.





FIG. 8.

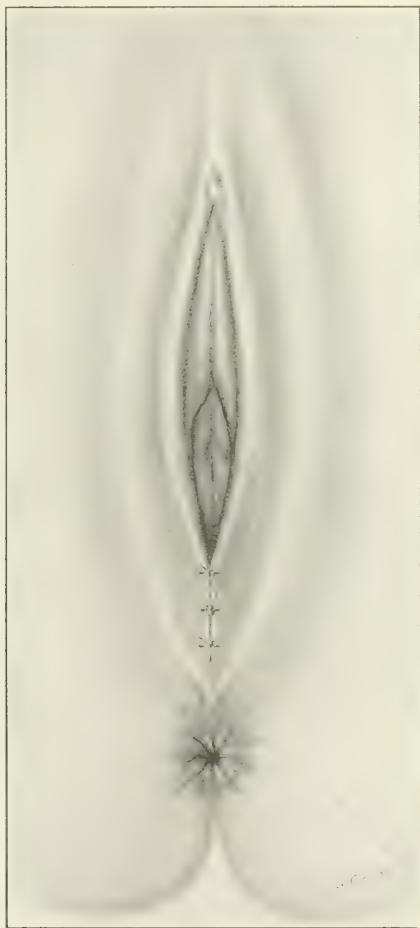


FIG. 9.

appears that the commonest injuries to the pelvic floor are: (1) A laceration of the anterior or lower segment of the levators close to the pelvic walls and not, as such an operation as the Emmet presupposes, in the midline of the posterior sulci. There remains a short tab of muscle attached to the ischium and pubis while the main bulk of the muscle is retracted toward the midline, without firm attachment. (2) A median laceration of the deep transversus perinei with lateral retractions of the two muscle halves. (3) A separation of the junction of the superficial transversus perinei and of the bulbo-cavernosus muscles in the middle line, where they are inserted in the perineal body.

With these facts in mind the writer has for several months, and in a large number of cases, contributed by two hospital services and three ambulatory dispensaries, proceeded as follows: A transverse incision is made in the perineum; this is bisected below by a longitudinal incision and above by two incisions running along the lateral aspects of the posterior sulci (Fig. 2). The angles of mucous membrane left by these incisions are cut away with scissors as indicated by the dotted lines in Fig. 3, to get rid of redundant tissue and to give access to the underlying muscles. The denuded figure, when completed, is that of an extensive Emmet operation. Deep incisions are next made as illustrated in Fig. 4, and the space thus broken into is further exposed by a blunt dissection which brings into view the ends of the levators where they were originally lacerated and the retracted ends of the deep transversus perinei muscle, as shown somewhat diagrammatically in Fig. 5. The torn ends of these muscles are united with chromic catgut as shown in Fig. 6, and after the muscles are joined in the position and after the manner of their original relations before injury, the denuded surfaces above them are closed by the old Emmet technic (Figs. 7 and 8), this part of the operation being quite as extensive as we used to think an operation need be for the repair of the pelvic floor, although it completely failed to remedy the most serious part of the injury. The perineal sutures, in joining the perineal body, rejoin the ends of the superficial transverse perineal and the bulbo-cavernosus muscles.

When the operation is finished, an unprejudiced person, accustomed to gynecological examinations and with a sufficiently broad training in the diagnosis of pelvic injuries at all stages, must admit, I think, that the restored pelvic floor has a more normal feel and affords a firmer support than can be obtained by any of the other operations at present in vogue. This, I find, has been the opinion of all the visiting surgeons who have witnessed the operations and I

venture to hope that a more extensive trial of this technic in others' hands may demonstrate that we have at our command a method for the complete and lasting restoration of the pelvic floor without distortion of anatomical relations or exaggerated narrowing of the vagina.

1821 SPRUCE STREET.

## OBSERVATIONS UPON THE FORMATION OF TERATA.

BY

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THE cause and mode of origin of terata, after having passed from the stage of mysticism, through that of maternal impressions and supernatural visitation, has come to be considered from the standpoint of rational biology and accordingly the various problems presented by these curious malformations are much nearer a solution.

The literature on this subject is a rich one and will not be reviewed here save in so far as it bears directly upon one phase of the problem, namely, the reasons underlying the natural arrangement of terata into certain well-defined groups.

The first really scientific work in this connection was that of Meckel(1) who pointed out the hereditary character of certain structural anomalies. It was this conclusion that opened the problem to the minds of investigators generally and since the appearance of Meckel's article a tremendous amount of work has been done along the lines of anatomy and embryology as well as from the experimental side.

A teratoma according to the excellent definition of Schwalbe(2), is an alteration occurring during fetal development, *e.g.*, a congenital alteration of one or more organs or systems of organs or of the whole body, which does not come within the range of variation of the species.

These structural anomalies may be divided into two great groups, those which are hereditary and germinal and cannot be reproduced, and those which are not hereditary, but are due to some mechanical injury or disease. Many merosomatous terata (anatomical anomalies and variation of extremities) and possibly some cases of arrested development as hare-lip, are germinal and cannot be reproduced.

For the classification and grouping of monsters, the writer has

employed Birnbaum's(3) modification of Ballantyne's arrangement.

#### A. Single monsters.

i. Malformations due to arrest of development, as hypoplasia of the whole body, aplasia of single organs or of parts of the body. Arrest of development in the form of fissure or duplicature, fissure in the median line of the thorax or abdomen, fissure in the face, doubling of the vagina and uterus, fusion or union of organs lying in relation to one another.

ii. Malformations due to excess of development. Partial or general excess of growth, increase in the number of organs, mammary glands, spleen, suprarenal capsules, fingers and toes, teeth, ribs, and vertebræ.

iii. Malformations due to errors in development (monsters by altered relation). Transposition of viscera, ectopia testis, etc.

iv. Malformations due to displacement of tissue and persistence of fetal structures; dermoid cysts, etc.

v. Malformations due to the fusion of sexual characters; hermaphroditism.

#### B. Double monsters.

The question of greatest interest in a study of monsters is the cause of their abnormal development and the manner of its action. The ultimate cause is now considered to be concerned with one of two entirely independent factors; either it is some alteration of the germ plasm itself, by which the monster is begun at the moment of conception or very shortly after, or there occurs some error of implantation of the ovum causing improper development.

The germ plasm theory was strongly held by the older teratologists, but has since been largely supplanted by the principle of faulty implantation of the ovum, except in the case of certain hereditary forms and in cases of double monsters, wherein it still holds good.

Schwalbe(2) in discussing the probable cause of double monsters, reaches the following conclusions:

a. In the cases of most double monsters the time for the action of the cause closes with gastrulation.

b. The primary cause is a subdivision of the egg material which develops two formative centers.

c. The cause may lie in a displacement of the early blastomeres with respect to the norm (granting with Driesch that the prospective significance of a cell is a function of its position, a disturbance of the normal position, and hence the relationships of a cell may cause it to develop differently).

*d.* All that may be postulated in general, to cover all cases, is a division of the egg material. Special cases must be considered by themselves.

It will be seen that Schwalbe entirely ignores the theory of faulty implantation and also that he, in common with other investigators, gives no explanation of the constant grouping of monsters, both single and double, into certain definite varieties which is so characteristic of these malformations.

With respect to merosomatous monsters the work of Mall(4) is by far the most conclusive and searching. Working with pathological human embryos, Mall reached the conclusion that monsters are produced by external influence upon normal ova which affect the nutrition of the embryos due to faulty implantation of the ovum. That the power to become a monster is present in every ovum is fully demonstrated by experiment upon a variety of vertebrates as well as by pathological human ova, especially those obtained from tubal pregnancies.

This very important generalization runs directly parallel with that of Hertwig(5), who after an elaborate experimental work upon the production of spina bifida in frog's embryos, by the use of a solution of sodium chloride, made the statement that any human ovum may become a monster either anencephalic or otherwise and that it is not due to any abnormal condition of the germ, but to external influences which affect the growth of the egg.

Experimentally monsters may be easily produced in amphibian, fish and bird embryos from perfectly normal fertilized eggs.

In general the methods employed by experimental teratologists is to subject the eggs to various insults which affect the nutrition and impair the growth of the embryo. If now a similar condition can be found to exist for human pathological ova, which corresponds with those produced by the experimental teratologists, the point is proved; that is, many merosomatous monsters may be formed by placing normal ova into an unfavorable environment. It is a significant fact that immersion of the eggs into different chemical solutions produces different types of monster, for example by the use of solutions of sodium salts there are produced terata showing spina bifida and anencephaly, while where magnesium compounds have been used the forms show some tissue destruction, resulting in cyclopia and club-foot.

The usual conception of a monster is that of a deformed and mutilated creature. A most important contribution in this connection is that of Wilder(6) who regards the symmetrical mon-



sters not as deformities, but as orderly though abnormal beings. Wilder, in his conclusions, states that:

(1) Bilaterally symmetrical beings of both usual and unusual types are not deformities but are developed in respect to their architecture by means of a mechanism of control inherent in the germ. Such beings developing in obedience to definite laws may be termed cosmobia, or orderly living beings.

(2) In respect to frequency of occurrence cosmobia may be considered as normal or abnormal, the former being the usual type, the latter the unusual. Of the latter, some may be, in respect to their parts, less, and others more than the normal: the monsters *in defectu* and monsters *in excessu* of the older teratologists.

(3) All forms of cosmobia, both normal and abnormal, may become deformed and misshapen, so that the bilaterality is incomplete and the physiological processes hindered. Such deformity, which may be considered as secondary, is very much more frequent in the abnormal than in the normal cosmobia, since both the surroundings during development and the anatomical mechanisms are fitted for the normal type.

It may even happen that certain abnormal types, which are theoretically possible, cannot come to full development, being always and inevitably stopped at a definite period by some mechanical difficulty which it is impossible to overcome.

These difficulties are different in different animals, since the anatomical structure and the mode of development is different and this may account for the frequency of certain types of monsters and the nonappearance of others in certain animals or animal groups.

(4) As in normal, so in abnormal cosmobia, the ultimate cause for the development of the organism and its architectural details, lies in the germ and is probably determined by the time of the first cleavage. There is thus neither a fusion of parts already formed nor a gradual development from the normal toward the abnormal during embryonic life, but the parts appear doubled or reduced from their first appearance and their development is controlled in the same way as are the bilateral structure and other architectural characteristics of normal beings.

(5) There may be constructed an almost unbroken series (or rather several related series, differing in their geometrical relation) which begin at the most defective cyclocephalus or symmelus, progress step by step until the normal condition is obtained and then again, passing this point, run through the various grades of diplopagi to the stage represented by separate duplicate twins.

The foregoing résumé of the principal facts in connection with the formation of terata, gives an adequate idea of what a monster is, and some conception as to the physical causes of such aberrant development.

One side of the question is, however, left unmentioned, that is, the reason for the grouping of monsters into certain sharply defined varieties, which varieties are constant.

There must exist some fundamental agency which causes terata to assume one of a certain restricted variety of forms, no matter what may be the direct cause of the abnormal development and it is the conclusion of the writer that such phenomena are due to the fact that the abnormal conditions under which the ovum is developing, whether faulty implantation of the ovum itself, disease of the uterus or abnormality of the germ plasm, act upon special organs or tissue groups at the time of their most rapid development or "critical period."

If this generalization be accepted, it follows that each organ or tissue has its own distinct critical period and that any malign influence brought to bear at this time will cause a constant and invariable effect upon the growth of the part involved.

In support of this conclusion the following underlying principles are offered:

All organs or systems of organs attain their growth not synchronously and regularly, but irregularly, each group having a period of maximum rapidity of development and cell reduplication, the neighboring tissues remaining fairly quiescent during this period. It is this event in the developmental cycle of the organ which has been termed the critical period. Furthermore there is a mutual inhibitory mechanism acting between neighboring organs or tissues, by which the size and the extent of growth of each part is regulated.

Should the inhibitory mechanism be disturbed by error in development of one organ or tissue the effect would naturally be to increase the growth of the related tissues either along the normal line or by reason of the control being lost, to force development into abnormal directions. In proof of the statement that organs do not develop synchronously the work of Jackson(7) seems conclusive. Jackson found by experiment that the size of an organ or part, like its position, form and structure, may depend upon or be related to the present, past or future.

The present refers to the physiological relation which the part bears to the existing organism and increase or decrease in function, being generally correlated with a corresponding increase or decrease

in size. The past refers to the conditions associated with the ontogenetic or phylogenetic history of the individual.

The future refers to changes in an organ which will take place in anticipation of phylogenetic needs which may arise at a later period in the life cycle of the organism. The condition determining the growth rate of an organ or organism (aside from heat, light and other external factors) may be traced back to the cells and placed under two general headings:

(1) Specific physicochemical differences in the protoplasm, chiefly determined (in the beginning) by heredity, which affect metabolism and thereby the growth rate.

(2) Conditions within the organism which affect the quantity and quality of available food and oxygen supply for the cells or which affect the removal of these waste products of metabolism.

With regard to the second statement of the writer concerning the mutual inhibitory mechanism, the conclusions of Lewis (8) are most suggestive. In transplantation of groups of cells from one frog embryo to another, Lewis found that the tissues which have developed from the transplanted piece are much greater in bulk, very much greater in the case of the chorda and muscle, than such a piece would have produced in the same time had it remained in the normal position in the embryo from which it was taken. This is an indication of how the neighboring parts in a normal embryo must interact upon each other, regulating the size or extent of growth for each such part. It is possible that when such pieces are freed from the influence of the whole on the part, that cell division can take place more rapidly and so produce a greater volume of tissue from the same original number of cells than under the usual conditions of growth. The entire question of the critical period and its bearing upon normal and abnormal growth of the organism is by no means proven even in the mind of the writer, but it is certainly most suggestive and deserving of further investigation.

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348 SOUTH FIFTEENTH STREET.

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## EXTRAUTERINE PREGNANCY AND ITS SUBSEQUENT HISTORY: AN ANALYSIS OF ONE HUNDRED AND FORTY-SEVEN CASES.\*

BY

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Philadelphia.

THE following statistical study of 147 cases of extrauterine pregnancy and their subsequent obstetrical histories is based upon the records of the cases admitted from 1902 to 1912 to the clinics of Dr. Barton C. Hirst at the University and Howard Hospitals. A few cases are included from the private case records of Dr. Hirst before 1902.

Regarding the social condition it is found that 134 were married, ten were unmarried, while no mention is made of the remaining three cases. One patient, a married woman, admitted that pregnancy was illegitimate.

The ages of the patients include practically every year in the child-bearing period; ranging from eighteen to forty-six as the extreme in either direction. Two cases occurred in the second decade of life, one at eighteen and the other at nineteen years. Three cases occurred in the fifth decade, at forty-one, forty-two and forty-six years. The largest number of cases for a single year was ten cases at thirty years of age. The second largest number for one year was nine cases, this happened for the two years of age twenty-seven and thirty-four. The average age was thirty years in the ninety-four cases where it is noted.

In 121 histories mention is made of the number of the pregnancy. In twenty-eight cases, 23 per cent., the extrauterine gestation was the first pregnancy. In twenty-six it was the second pregnancy, in twenty-four the third, in fourteen the fourth, in eleven cases each it was the fifth and sixth. It occurred twice as the seventh and once each for the eighth, ninth and twelfth pregnancies.

\* Read before the Philadelphia Obstetrical Society, March 6, 1913.

In the previous obstetrical histories of these cases, forty-two of the 147 gave a history of a previous miscarriage, 30 per cent. having had pregnancies terminating in this manner. In eighteen cases there had been only one miscarriage, in thirteen cases two, in eight cases three, in one case there had been four, in another five, while the remaining case is recorded as having had many miscarriages. In seven cases the only previous pregnancy had ended in a miscarriage.

The condition of the previous pregnancy was elicited from ninety-two patients. In sixty-two cases, 67 per cent., it proceeded to full term, in twenty-six cases, 28 per cent., it terminated in a miscarriage, and in seven cases, 4.7 per cent. of the whole series, it had been an extrauterine pregnancy. In twenty-eight cases no pregnancy had preceded, while no mention is made in twenty-six cases.

Where a normal pregnancy had preceded the extrauterine pregnancy the shortest period of time which had elapsed between the two was seven months. This happened in two cases. Five cases occurred within a year after a normal pregnancy. The longest period of time after a normal pregnancy was thirteen years, three cases occurred ten years or more after a normal pregnancy. The average time in the fifty-four cases where the date of the preceding normal pregnancy was given until the extrauterine pregnancy developed was three years and eight months.

Where the previous pregnancy had terminated in a miscarriage the shortest period of time until the development of the extrauterine pregnancy was five months. In three cases the miscarriage was followed within a year by the extrauterine pregnancy. The longest time elapsing was six years, while the average time of the interval in the twenty-five cases where the date of the miscarriage is given was three years and ten months. The average time following an intrauterine pregnancy, whether it ended prematurely or proceeded to full term, was three years and nine months.

In the five years where the extrauterine pregnancy repeated itself without an intervening intrauterine pregnancy, the time of the interval was given in one case as six years, in the second as one year, in the third as eighteen months, in the fourth as fourteen months and in the fifth as ten weeks.

An average time of almost two years elapsed before the condition was repeated. In the two other cases where a previous extrauterine pregnancy had occurred an intrauterine pregnancy had intervened before the present condition developed.

Of the eighteen legitimate cases where the pregnancy occurred

in a primipara the period of time after marriage was noted in six cases and varied from four to eighteen months. The average time elapsing after marriage was ten months. In the ten illegitimately pregnant primipara it was impossible to determine the period of time after possible impregnation.

A history of previous pelvic peritonitis following normal labor or miscarriage was obtained in four cases. Difficult instrumental deliveries were noted in four cases.

Pain was given as a symptom in 110 cases. In seventy-six it was noted as being abdominal alone. In other cases it was mentioned as having been experienced in the rectum, the back, the pelvis and the inguinal regions. In six cases it was referred to the leg of the same side as the tube affected, with one exception. Many terms were used by the patients in describing the character of the pains.

The duration of the pain was noted in sixty-one cases. In one case the pain had been felt for a period of four months. In eight cases there was but one attack of pain, in each of these cases the tube was found ruptured at operation. The average duration of pain was eighteen days. Pain was associated with fainting in thirty-six cases. Nausea was present in thirty-four cases and was accompanied with vomiting in nine cases.

The length of time from the preceding menstrual period was noted in seventy-nine cases. In one instance, an abdominal pregnancy, there had been a period of amenorrhea for eleven months. In another case there had been no menstruation since the beginning of a previous normal pregnancy eighteen months before. In seventeen cases the condition was found within a month after a normal menstruation. The average amenorrhea was sixty-nine days. In thirteen cases it was impossible to calculate the period of amenorrhea owing to the irregular menstrual history of the patient.

A discharge from the vagina was recorded in seventy-eight cases. In sixty-nine there was a discharge of blood, in twenty-three a discharge of what was apparently decidua, this was described variously as shreds, membranes and pieces of flesh. Blood and decidua together were passed in seventeen of these cases.

The physical examination of these patients revealed sixty-six times a mass palpable through the vagina, an abdominal mass was noted in thirty-two cases, while a mass palpable through the vagina and through the abdomen was present in twenty-four of these cases.

Operation was performed in one hundred and forty-three cases, in each instance a laparotomy done, and in addition posterior



colpotomy was done twice to allow for additional drainage. Abdominal drainage was used after fourteen operations.

Regarding the hemorrhage, it was noted to have been clotted in thirty-five cases. Fresh blood was present twenty-one times, fresh and clotted together seventeen times, and active bleeding was noted in four cases.

Seventeen cases were operated upon in shock, all of whom recovered; four were operated upon without an anesthetic.

The location of the gestation sac was noted in 132 cases. The right tube was affected in sixty-nine, the left tube in fifty-three cases. There was one bilateral tubal pregnancy. Abdominal pregnancy occurred three times, in one instance being primary (1). Ovarian pregnancy occurred twice and broad ligament pregnancy three times, one patient had an interstitial pregnancy on the left side. The sac had ruptured in twenty cases, aborted in twenty-five, and was noted as not having been ruptured in nine cases.

In addition to a diagnosis of abortion, made in a number of instances, dilatation and curetage was performed on fifteen patients for this supposed condition before they were admitted to the hospital.

The fetus was recovered in twenty-eight cases and its size was noted in twenty-three. This varied from as large as the tip of the little finger to an overgrown fetus removed from an eleven months' abdominal pregnancy. The average size was that of a six weeks' intrauterine fetus.

In seven cases the tube of the opposite side was in an actively inflamed condition. In eight cases it had been removed at a previous operation. The appendix was removed in the six cases where it was found to be diseased. The uterus was retroverted in one case. In one case a six weeks' coincident intrauterine pregnancy aborted ten days after the operation (2). Uterus unicornis was noted once. The ovary of the opposite side was noted as cystic in three cases, and the ovary of the same side as being prolapsed in one case. The ovary of the same side as the affected tube was removed in sixty-one cases. Adhesions were noted about the affected tube in four cases.

Sterilization was performed in eighteen cases. By virtue of the opposite tube having been previously removed eight times, for inflammation of the opposite tube, seven times, and once each for septic inflammatory condition of the pelvis, cystic disease of the opposite ovary and for a bilateral tubal pregnancy.

Death occurred four times, a mortality of 2.7 per cent., the re-

spective causes of death being peritonitis, postoperative pneumonia, primary hemorrhage and secondary hemorrhage.

Of interest are the histories of four other cases, not included in the series. In each of these death occurred before the patient could be brought to the hospital for operation. One case, refusing to come to the hospital on the first visit of the ambulance, died as it reached her home on a second call sent in a few hours later.

The subsequent obstetrical histories of the cases in which the development of a later pregnancy was possible were obtained by means of a circular letter sent to the patient or to the physician who had referred the case to the clinic. Owing to change of address a large number of cases was not reached.

Thirty women, 52 per cent. of the cases traced, replied that no subsequent pregnancy occurred. Twenty-eight pregnancies ending at term developed in eighteen women. Delivery was effected in two cases by forceps. Eight women had pregnancies terminating prematurely. Three of these cases, abortions, occurred after the cases had already had a full-term pregnancy subsequent to the extrauterine. One case of premature labor was complicated by a placenta previa. One case, having pain and a bloody vaginal discharge after a period of amenorrhea of two months, was diagnosed by the attending physician as a repeated extrauterine pregnancy. Operation was refused, the patient recovered after a long convalescence and has had no further pregnancies.

Three women report they are again pregnant, one at eight months, following a full-term pregnancy, the others at six and at four months, respectively.

In two cases where the extrauterine pregnancy repeated itself after an intervening intrauterine pregnancy, the first case had a full-term pregnancy twelve months after the first operation and thirteen months later an extrauterine pregnancy developed in the remaining tube. The second case had an abortion at the third month of pregnancy, eleven months after the first extrauterine, and developed the condition again fifteen months after the abortion. In the other five cases where the condition was repeated no intrauterine pregnancies intervened. Three of the seven cases which had a repeated attack were primipara and had no intervening intrauterine pregnancy. One of these cases was illegitimately pregnant on each occasion.

The ratio of repeated extrauterine pregnancies to the subsequent full-term pregnancies is seven to twenty-seven, or, considering all intrauterine pregnancies which have developed, thirty-seven in number, the ratio is as 1 to 5.28.

To summarize briefly it is found that:

Twenty-eight, 19 per cent., occur red in primiparous women.

Twelve cases, 8 per cent., were illegitimate pregnancies.

Forty-two cases, 30 per cent., had a history of previous abortion; in twenty-six cases, twenty-eight per cent., the preceding pregnancy had terminated prematurely.

The average interval after an intrauterine pregnancy until the extrauterine pregnancy developed was forty-five months.

The average interval between the two attacks in the seven cases where the condition was repeated was twenty-four months.

Recovery was noted for each of the seventeen cases operated upon in shock.

Sterilization was performed eighteen times, in eight of these cases the opposite tube had been previously removed.

Thirty cases, 52 per cent., of the fifty-eight cases whose subsequent history is known did not develop any later pregnancies.

Thirty-nine intrauterine pregnancies have developed subsequent to the extrauterine condition, twenty-eight ending at term, eight aborting while three are at present pregnant.

The extrauterine pregnancy was repeated seven times, a ratio to the intrauterine pregnancies of 1 to 5.5.

In closing I wish to thank Dr. Hirst for the privilege of reporting these cases.

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1911 PINE STREET.

## IN MEMORIAM.

### DR. ALEXANDER HUGH FERGUSON.

THE twenty-fifth annual meeting of this distinguished Society is about to close.<sup>1</sup> Twenty-five years in the life of a society leaves it still young but in that time it has seen charter members and distinguished fellows leave these meetings and return no more.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

When the Louisville meeting was being held one year ago, a distinguished fellow, the subject of this sketch, Dr. Alexander Hugh Ferguson, student, teacher, author, surgeon, inventor, leader of men, was meeting sickness for the last time. "He saved others, himself he could not save."

Limitations of time and capacity prevent a full consideration of the life and work of Dr. Ferguson. To name his official connection with the profession and his contributions to medical literature would occupy no small measure of space or time. If I could be permitted to point out from the life of this virile productive and broad-gauged man incidents which would stimulate us to greater efficiency or higher ideals or deeper sympathies, I would but repay the Society in a small measure for the honor conferred on this occasion.

If the members of this society were asked to name a preference as to ancestry other than their own, nine out of ten would choose Scotch. Dr. Ferguson very early in life showed acumen in the choice of ancestors; they were Scotch. Of this Dr. Ferguson was justly proud. A short time before his last sickness I had the pleasure of introducing him at a banquet at which time a cartoon of Dr. Ferguson as Scotchman in kilts and playing the bagpipe was shown. This cartoon he carried home to his folks with great pleasure and national pride. His parents were not only Scotch but they belonged to the progressive type of Scotch—they left Scotland and came to America. Here in Manilla, Victoria Co., Ontario, Canada, young Alexander Hugh Ferguson was born in 1853, the seventh child of a family which later numbered nine. If we may judge of times, conditions, Scotch Canadian thrift and the size of the family, we must conclude that young Ferguson while dreaming of the future was not a stranger to toil, struggle, hardship and rigid economy, things which make mightily for character. The pioneer spirit of the Fergusons' as later exhibited in Dr. Ferguson's surgical work is shown by their second transplantation to Manitoba when Winnipeg was hardly more than a village and trading post. We glean from reliable sources that as a boy and youth Alexander Ferguson was active, robust, athletic, but while not a bookworm was a close student, even going outside of the required school work to ground himself in the fundamentals of a scientific education. We find him a marked man for excellency of work as student and tutor in Manitoba College and leaving an impression upon the faculty as well as upon his opponents on the football field. Struggling toward a higher education, we find him teaching in interims of college work and many

a frontier lad must have been awakened by an enthusiasm not possessed by the average teacher. In 1881 we find him graduating from the Medical College, Trinity University of Ontario, with high honors and receiving the degrees of M. D., M. B., C. M.

Buffalo has the honor of being his first location in practice, and while his success might have been less precipitate had he remained yet it would have been to add luster to the name of Ferguson and greater fame if possible to the surgery in western New York. But the spirit of the Canadian West with her growing opportunities and the love of an aged mother in lonely Manitoba were calling above the roar of Niagara and in 1882 he threw his energy, enthusiasm, ability and training into the upbuilding of medicine and surgery of the great Northwest. Here he at once showed himself a leader of men and an educator. Through his capacity for work, ability to make friends, and his rare good judgment his rise was rapid. The first year he was registrar of the College of Physicians and Surgeons of Manitoba, the second he was instrumental in founding the Manitoba Medical College in which he was Professor of Physiology and Histology from 1883 to 1886. From 1886 to 1894 he was Professor of Surgery in this institution and was prominent on the surgical staff of the foremost hospitals of Winnipeg. The esteem with which he was held by the medical profession is shown by the fact that he was elected first president of the Manitoba (Pioneer) Branch of the British Medical Society, 1892-1893.

The twelve years of Dr. Ferguson's life spent in Manitoba were active years, first of general practice and later of general surgery. A close observer, an acute diagnostician and a bold executive and located in the metropolis of the Northwest he was consulted from far and near by those with obscure diseases. His location gave him opportunity and Dr. Ferguson was not one to remain indifferent.

Winnipeg was the supply station for the great Northwestern fur trade. From this point went forth the man and his dogs into the long intense and lonely northern winter. Out of this lonely life grew a comradeship between the man and his dogs. Back to civilization came the survivors of this rigid life bringing their furs for the market, their stories of hardship and their *echinococcus* infected livers for Dr. Ferguson's clinic. Out of this experience the young surgeon developed a diagnostic acumen that was well-nigh marvelous and through his published observations he attracted the attention of the medical world. In after years as these men came out of the North with advancing spring and found their "wizard" gone, they

followed him on to Chicago and so he continued an experience in hydatids of the liver that far exceeded that of all other Chicago surgeons combined. One of these cases he demonstrated to me in our office a few weeks before his last sickness, clinching the diagnosis by the presence of a peculiar thrill upon succussion, which his unusual experience enabled him to detect.

Dr. Ferguson's short years in Winnipeg had brought him a vast experience, had elevated him to the head of the medical profession and stamped him as a public figure of the rapidly developing province. While yet a young man of forty, he had measured his strength against the Northwest and had won. His greater ambition longed for keener competition to demonstrate that he had not won because of isolation. He with many others responded to the "I will" spirit of Chicago of World's Fair time. None perhaps hearing the "call" left as much as he left in Manitoba. None coming had so little to regret as he. During the depressing times and keen competition following the Fair Dr. Ferguson steadily, we might say rapidly, made his way while others fell by the wayside.

During the latter years of Dr. Ferguson's stay in Canada he had found time to visit the clinics of America, Scotland, England and Continental Europe. He also took a course in the laboratory with Prof. Koch. Up to 1890 he had been working, observing, studying and experimenting; from that time until his death we find him a prolific writer and no one familiar with his work doubts that he had much to contribute. Scarcely a subject has interested the surgical world in the last twenty years but what an investigation would find Dr. Ferguson a pioneer thinker and worker. If the technic was difficult or obscure Dr. Ferguson originated a method. If an instrument was lacking he invented one. Versatility, dexterity, boldness and unerring judgment characterized his surgical work. If we mention his work upon "Hyadtids of the Liver," "Inguinal Hernia," and "Cleft Palate" as of special importance, it is not to discredit his other work, for should these be overlooked his valuable contribution to the surgery of male and female genitalia, the kidney, gall-bladder, stomach, intestines, appendix, thyroid gland, etc., etc., would entitle him to a larger place in medical literature than is reserved for most men in his field. To mention the societies of which he was a member or fellow would be to quote names of most of the local, national and international societies devoted to the consideration of general surgical work. His membership also extends to local special surgical societies and to many medical, scientific and



sociologic organizations outside of his special work. Many of these societies had been served by him as president.

Dr. Ferguson was a strong, rugged type not given to hypocrisy and detested it in others. He took no halfway ground. He went directly at the root of the matter. He was an ardent, enthusiastic, yet withal, kindly contender for what he deemed the truth, and no one taking issue with him need figure upon finding him perturbed or unprepared to defend his position. Strong, positive natures invite opposition and this Dr. Ferguson encountered but his open, honest, aggressiveness and defense commanded the respect of even his opponents. Much might be said of Dr. Ferguson's educational and professional work in Chicago but time forbids. He was elected to the chair of surgery in the Post-Graduate Medical School before locating here in 1894. In 1900 he was elected Professor of Clinical Surgery in the University of Illinois and began undergraduate teaching, in which as well as in his postgraduate work he was eminently popular, thorough and successful. When stricken down he had just completed a year of presidency of the Chicago Medical Society. A few years since his excellent work was brought to the attention of the King of Portugal and by him was Dr. Ferguson decorated "Commander of the Order of Christ." Up to a short time before his death one would have said that his hardy rugged constitution and his close knit powerful physique would carry him on to many years of usefulness. With the same judgment exercised that he exhibited in the care of others he should be with us to-day. We cannot but regret the untimely cutting off of this genial whole-souled, productive, brilliant fellow of our society.

Early in his professional career, in 1882, Dr. Ferguson was married to Miss Sarah Jane Thomas, daughter of Edward Thomas, Esquire, of Ontario, Canada. To this union were born two sons, Ivan H. and Alexander D., a physician, who with Mrs. Ferguson survive him and to whom he set an example of the useful life and left a noble inheritance.

CHANNING W. BARRETT.



## TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

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*Meeting of March 6, 1913.*

*The President, GEORGE M. BOYD, M. D., in the Chair.*

DR. F. HURST MAIER presented the report of a case of

### PELVIC HEMATOCELE AND EMBOLISM OF UNUSUAL ORIGIN.

Mrs. L., married, aged twenty-nine years, operated upon January 23, 1913.

*Operations.*—Uterine curetment; right salpingo-oophorectomy, appendectomy, and shortening the left infundibulopelvic ligament.

*Pathology.*—The right ovary was about three times its normal size, with small cyst degeneration of the parenchyma. The right tube was about the thickness of a finger, with closure of the abdominal end. The appendix was enlarged and presented evidences of inflammatory changes. The left tube and ovary were apparently normal but displaced to a much lower level. As the latter condition was due to a relaxation of the infundibulopelvic ligament, it was corrected by introducing a cat-gut suture in such a way as to double the ligament. The appendectomy was done last, and the routine inspection of the pelvis before closing the abdomen showed no signs of bleeding.

Almost immediately following the operation, the patient complained of distress in the left iliac region. This feeling never amounted to real pain, but persisted up to the time of the second operation. The distress was always greater if the patient tried to lie on her right side. The symptoms were of so indifferent a character, however, unaccompanied as they were by pyretic manifestations, that little attention was paid to them. On the fourth day the patient was seized with a sharp pain at the base of the right lung. As it was associated with moderate dyspnea, slight cough with a small amount of bloody sputum, a temperature of 103, and a pulse of 120, a pulmonary embolism was diagnosed. The diagnosis was corroborated by the transient character of the symptoms and the absence of any decided physical evidences of pneumonia. With the subsidence of the pulmonary symptoms (the abdominal wound having healed by first intention), there being no decline of the trouble in the left iliac region, a vaginal examination was made. The examination demonstrated the presence of a fluctuating mass that filled the left half of the pelvic cavity. The right half was not involved. Through a posterior colpotomy, done a few hours later, a large amount of dark

fluid blood, with a few clots, was emptied. The cavity was lightly packed with gauze which was removed at the end of forty-eight hours. Five days later, the patient free of symptoms, was allowed to leave the hospital.

My only reason for presenting this case before the Society is the unusual origin of the hematocele and of the embolism. The only way that I can account for the complications in so simple a procedure is that in suturing the ligament the needle was introduced into the left ovarian vein. Following this there was a slow leakage that gave rise to the pelvic collection of blood, and the cat-gut in the vessel wall formed a nidus for a small thrombus formation that eventuated in a pulmonary embolism.

DR. WALTER P. CONWAY presented the report of a case of

#### TUBAL PREGNANCY UNRUPTURED AT TERM.

The following case from my service in the Atlantic City Hospital, I consider of sufficient interest and importance to narrate.

Anna F., colored, age twenty-three, married six years, occupation waitress, was admitted to the ward on April 1, 1912, with a diagnosis of abdominal pregnancy at term, probably a dead fetus.

*Family History.*—Father died of uremia and mother of pneumonia, about eighteen years ago.

*Early History.*—Had the usual diseases of childhood; menstruated first at fourteen years of age.

*Present History.*—One healthy child five years old; one abortion at one month, four years ago; and one miscarriage five and a half months, two and a half years ago. She enjoyed good health until pregnant this time. Menstruation always regular except when pregnant. Last regular menstruation was in May, 1911. She experienced a slight flow in June and July accompanied with severe pain on the right side and low down in the groin. In August the menstrual flow, although slight, was constant and at times very dark in color. This flow continued all during the month, with pains of cramp-like character, always on the right side, low down in the abdomen and extending down the right leg. She experienced the usual signs of pregnancy since June. She felt life in September. From October to March, these attacks of cramp-like pain in the lower right quadrant of the abdomen continued intermittently once or twice daily, lasting from a few minutes to several hours. The discharge continued irregularly. In January and February she was obliged to remain in bed, on account of the severity of the pain. During all this time there was a gradual enlargement of the abdomen which, to her, seemed the same on both sides. About the first of March, the fetal movements, which had been much stronger than usual with her, seemed to cease entirely.

She was admitted to the hospital on April 1 with a temperature of 103, and a history of daily chills and fever for about a week. There was a brown, foul-smelling vaginal discharge. No fetal heart sounds could be heard. I advised operation for removal of

a dead fetus. On opening the abdomen, I found an enormously distended right tube which was very adherent on the right side to the parietal peritoneum, and to the broad ligament, but perfectly free on the left side. There were no adhesions to the omentum or mesentery. The uterus was slightly enlarged and there was a marked lateral displacement to the left side. The left tube and ovary were apparently normal. The right ovary was enlarged, cystic and easily removed with the ovisac. After freeing the peritoneal adhesions, the ovisac, which consisted of the right tube, was ligated and easily removed. There was little or no hemorrhage and no evidence of previous hemorrhage. This ovisac bore the same relation to the uterus, ovary and broad ligament as a hydrosalpinx. The contents of this tube were a perfectly formed dead fetus which weighed  $6 \frac{3}{4}$  pounds, a placenta which weighed  $3 \frac{1}{2}$  pounds, and about two quarts of thick, slightly greenish fluid. The placenta was attached to the posterior surface of the sac, and between the layers of the broad ligament. The placental vessels were thrombosed. The ovisac was very thin and perfectly intact, until easily ruptured in freeing the adhesions. The abdominal cavity was flushed with normal saline solution, drainage inserted in the lower part of the wound, and the incision closed with through and through sutures of silkworm-gut.

With the exception of an evening rise of temperature for several days, the patient made an uninterrupted recovery, and left the hospital in three weeks in very good condition.

DR. E. A. SCHUMANN presented a paper on

#### THE ETIOLOGY OF TERATOMA.\*

DR. BARTON COOKE HIRST presented a paper on

#### THE NEWER OPERATIONS FOR RESTORATION OF THE PELVIC FLOOR.†

DR. PHILIP F. WILLIAMS presented a paper on

#### A STATISTICAL ANALYSIS AND THE SUBSEQUENT HISTORY OF 147 CASES OF EXTRAUTERINE PREGNANCY.‡

#### DISCUSSION.

DR. WILLIAM R. NICHOLSON.—I have had one full-term extrauterine pregnancy and this is the only case I have ever seen. Operation was done about a month after a spurious labor. The child was dead. The bleeding was not as excessive as when operations are done during the life of the child. The wound was drained and the woman made a good recovery. There was a history of a previous extrauterine pregnancy. The first operation was done by Dr. Nassau. He found her in shock, operated and saved her life. Dr. Williams' paper was of special interest to me in its reference to the

\* For original article see page 1160.

† For original article see page 1149.

‡ For original article see page 1166.

two cases in which the patients died of hemorrhage. We do not hear so much as formerly about the advisability of waiting in cases of extrauterine pregnancies because the patients are in shock. I think the duty of operating is very definite no matter what condition the woman may be in. I personally would attempt operation if the woman were almost moribund.

DR. B. F. BAER.—I have so often spoken upon this subject that I am rather disinclined to do so now, for I can only repeat.

The case just reported as one of unruptured tubal pregnancy at term reminds me of the case I reported to the American Gynecological Society in 1888, and have more than once referred to here.

The patient, aged twenty-four years, had borne one child at full term without mishap and was, as she thought, again normally pregnant. At supposed term she went into labor and her physician expected normal delivery, as previously. Some hours later he was hurriedly called and found that a profuse hemorrhage had occurred. The os uteri was more dilated but the head was still not engaged at the superior strait. In short, the labor was spurious and futile because the child was not *in utero*.

One year later I found the patient septic and emaciated, with evidently a degenerating child in the abdominal cavity. Operation, in June, 1885, revealed such to be the case, and the sac containing the child appeared to be the Fallopian tube. I, however, did not believe that a tubal pregnancy could go to term without rupture, and I searched the literature for a year before I found an explanation, in a paper by Dr. Angus MacDonald of Edinburgh, entitled, "Report of a Case of Pregnancy in the Left Horn of a Bifurcated Uterus," etc. It now became clear to me that my case was of similar character.

Some time later I was luckily informed that the patient had a hernia, and I was afforded the opportunity of operating for it, when inspection revealed that the case was one of bicornate uterus, and that the gestation had been in one horn. Possibly the case reported this evening may have been of similar character.

Repeated tubal pregnancy I have met with in two instances.

Regarding the time at which operation should be done, I entirely and emphatically agree that it should be done immediately, if the condition of the patient and the environment are favorable to success. I do not believe, however, that we should operate upon a moribund patient. Two or three years previous to a year or two ago a good deal was said and written about a so-called penknife operation in these cases of extreme shock from hemorrhage following rupture. I then wrote that "To rush upon the scene in a penknife operation state of mind" was, to say the least, a dangerous position to take in these rare cases—that more deaths would result than to take the more conservative attitude, by using restorative measures while getting the patient into safer environment. By this time it would be found that the patient had rallied and that operation would then be safer. I have seen both ways applied, and I believe more lives have been saved by waiting long enough to

get the patient in the proper environment before operating. The individual case is seldom as bad as it appears, and the experienced physician or surgeon will not be stampeded into the "Penknife" region.

Wouldn't it be fortunate if we could always get the cases of tubal gestation at the ideal period for operation, that is, before rupture? Last Wednesday a patient came into my office in an anxious state of mind and asked me to operate upon her; and I have in this little bottle an unsuspected and unruptured tubal pregnancy of not more than two or three weeks' development. The patient, aged thirty-seven years, married twelve years, had never been pregnant. A week before I saw her she began to suffer with severe cramps in the right tubal region and then to show blood spots from the vagina; two of nature's distress signs that should never be disregarded. On last Friday, operation showed the right tube enlarged to the size of my little finger, and containing a clot not much thicker than a lead pencil and about an inch in length. The microscope revealed the chorionic villi which confirmed the macroscopic diagnosis of tubal gestation.

DR. JOHN A. MCGLINN.—I have never had the opportunity of operating upon a full-term extrauterine pregnancy. Some years ago I assisted Dr. Woods in a case of a six months' extrauterine pregnancy with a living fetus. Dr. Woods removed the placenta. It was attached to the posterior peritoneum and also to the intestines. Dr. Nicholson several years ago reported on the advisability of removing the living placenta at the time of operation. Any one seeing the uncontrollable bleeding would feel inclined, I think, to adopt the conservative rather than the radical treatment. In early ectopic pregnancy I have operated on sixty-one cases without a death. Two cases died before coming to operation. I think there should be a revision of the usual teaching upon this subject. It has been said that there is a long period of sterility in these cases. Dr. Williams' paper shows that there was but a little time between intrauterine pregnancy and the extrauterine conception. I have seen a number of cases in which the extrauterine pregnancy occurred shortly after the puerperium.

In the matter of operation I feel that we cannot lay down any hard and fast rules. I do not believe the dictum that only about 5 per cent. of women bleed to death. I have seen several cases in which I thought it unwise to operate at the time of shock. I do not believe that the amount of shock is dependent upon the amount of hemorrhage. I operated several weeks ago on a double ectopic pregnancy in which diagnosis was made before rupture. During examination the tube was ruptured on the right side. The pulse was 80, but after rupture, 140. When the abdomen was opened there was only about a teaspoonful of blood in the cavity. I feel, as Robb believes, that much of the shock is not dependent upon the amount of blood lost, but upon the rupture.

Some men differentiate between tubal rupture and tubal abortion. I believe that if the patient is not in profound shock the time to



operate is as soon as you possibly can. There are several reasons for this. If the bleeding continues there are adhesions. On the other hand, I believe there are a few cases in which it is much better to delay operation. If a patient is moribund it is not wise to operate, although in one case I took a chance and the patient recovered. In one case in which we did not operate, but cureted after a miscarriage symptoms developed and I suggested ectopic gestation. Inside of thirty minutes the woman died from ruptured tubal pregnancy.

DR. RICHARD C. NORRIS.—I was much interested in Dr. Conaway's case. We had a similar case at the Retreat, the difference being that in this particular case the fetal sac had ruptured. Pulse was 130; temperature 103, and the woman desperately ill but she recovered. We had the same ease and facility in removing the infant and placenta. Whether or not the placenta should be removed depends upon: (1) The operator's skill; (2) the possibility of determining whether the entire placenta can be removed and hemorrhage be controlled. For the average operator the lessons of the past teach us that it is better to pack and wait for separation. Men accustomed to doing abdominal surgery are oftentimes capable of removing a large live placenta safely. Frankly, if I were called upon to do this, I would match my skill with what I found in the individual case, and retreat under cover if I thought I could not attack the placenta by first controlling its blood supply. Temporary compression of the abdominal aorta has even been resorted to for that purpose.

Regarding immediate operation in tubal pregnancy, I cannot recall a case in which it was to the patient's advantage not to operate. I have met with all degrees of collapse, have had cases transfused while being transmitted in ambulances to the hospital and have been called to the hospital in emergencies, and I have yet to see a patient die where the prompt operation was done. I do not believe in pen-knife surgery, but modern, prompt surgery carefully prearranged in these cases is usually life-saving. There are some cases stamped with death, in which you would not think of operating. No surgeon of experience would operate on a moribund patient, or one practically dead. As Dr. Price used to say, we should go to these desperate cases just as a fireman goes to a fire—the sooner we get there, the better, but the surgery must be clean as well as quick.

DR. STEPHEN E. TRACY.—I have seen one case of ectopic gestation at term. Dr. Noble reported the case some years ago; the fetus had been in the abdomen many months, and was surrounded by a thick fibrous capsule. I have had one case of ectopic gestation of over five months, in which the fetus was alive. This case was complicated by fibromyomata uteri, and I was forced to do a hysterectomy. The hemorrhage was profuse, but was finally controlled and the abdomen closed without drainage. Operations on advanced cases of ectopic gestation are extremely difficult, and will test the skill of the surgeon. I fully agree with Dr. Norris, if there is any doubt in the surgeon's mind about being able to control the hemorrhage, that it is better to leave the placenta to separate and come away at a later date. In ectopic gestation, I believe the sooner the patients are subjected to

operation the better. I have operated on a number of patients who have been almost pulseless when placed on the operating table, and they have all recovered. I have had three cases of ectopic gestation rupture in the hospital, and I believe every one would have died if operation had not been performed promptly. The last one was a short time ago. When the patient was placed on the operating table, within a half hour from the time of rupture, the radial pulse was imperceptible. In this case, the entire circumference of the tube, with the exception of a small tag, had been torn through and the patient was bleeding profusely when the abdomen was opened. While I believe a case of ectopic gestation should be operated on as soon as the diagnosis is made, I do not approve of operations begun undertaken without the proper surgical surroundings and without the help of trained assistants, as the chance for recovery frequently depends on the surgeon's ability to do a rapid operation.

DR. F. HURST MAIER.—I feel sure that our views are in accord in regard to the necessity of operating promptly in cases of extra-uterine gestation, although, as Dr. Norris has well said, we do see cases occasionally in which it is better not to operate. Concerning the practice of delay as advocated by Drs. Simpson and Stellwagen, I recall a case that occurred, in Dr. Montgomery's service, at the Jefferson Hospital, illustrative of the danger of this method. In the examination of a dispensary patient, suffering from tubal pregnancy, the sac was ruptured. She refused operation until the consent of her husband had been obtained. Although he was promptly sent for, by the time he arrived, it was too late.

As to the danger of sequelæ following unoperated cases, this was exemplified by a case upon which I operated a few weeks ago. A woman was brought to the hospital suffering from intestinal obstruction. At the operation, an old ruptured tubal sac, and pelvic hemocele, with extensive adhesions to the intestines were found.

DR. JOHN C. HIRST.—I should like to refer to a lesson I learned in the last year which has been of much value to me. There was the occurrence of unexplained pain that suggested a miscarriage. Last May I curetted the patient and removed a rather badly decomposed three months' fetus. She was in the hospital only a week or ten days. She was a great sufferer from headache. Two weeks after going home from the hospital she sent for me because of a sharp attack of pain. Just as a matter of routine I made a pelvic examination and found what had not been there at the time of the operation, a mass about the size of a hen's egg on the left side of the uterus. I made a diagnosis of extrauterine pregnancy and took an eight weeks' ovum out of the left tube. This taught me not to disregard pains even in neurotic conditions. As to operating upon a so-called moribund patient, I agree with Dr. Nicholson that no case is too nearly dead to attack. I had one case sent into the University hospital during my brother's absence with the usual history: respirations, four a minute and the usual pelvic signs. I operated only at the request of the family. The operation was hurriedly done. A tremendous amount of blood clot was cleaned out. The tube and ovary were tied off and

removed. The patient is well and walking around to-day. I have never seen a patient in the least injured by immediate operation, providing it was done under proper conditions. I should not hesitate if the family understood the risk.

DR. STRICKER COLES.—My experience has been that in at least one-half of my cases, when the abdomen was opened the ruptured vessel in tube was still bleeding. I have felt that if there was a chance, no matter how bad the condition of the patient, it was well to give salt solution and operate, as soon as possible after the passing of initial shock.

DR. JOSE W. FITHIAN.—Dr. J. S. Baer of Camden had a patient sent to him as one of "missed pregnancy," whom I saw. It was found to be a case of extrauterine pregnancy at term with the head presenting at the posterior culdesac. A living child was extracted through the vagina which lived twenty-four hours. The live placenta was not removed until the third day. The woman made an uninterrupted recovery. This was the only case I ever saw of a living child of an extrauterine pregnancy at term or past term.

DR. EDWARD A. SCHUMANN.—There is an anatomical fact in connection with this subject which is of the greatest interest to me. It may be remembered that some time ago I had the pleasure of presenting before this Society a series of specimens of the female genitalia of the lower mammals.

In a number of these specimens the uterus was bicornuate, the long cornua being the normal site of fetal attachment and development. The Fallopian tubes in these animals are very short, and it is more than possible that the proximal half of the human tube is a homologue of the uterine cornua in the lower animals, and hence, in certain cases of atavistic type, the tube becomes naturally the seat of a pregnancy.

This belief is confirmed by the histological examination of a large series of tubes, wherein the proximal end is frequently found to contain a prominent muscular coat, strongly suggestive of the structure of the uterine cornua of certain lower mammals.

DR. GEORGE W. OUTERBRIDGE.—Dr. Williams said he had three cases of abdominal pregnancy of which one was primary. I should like to ask him why he diagnosed this case one of primary abdominal pregnancy.

DR. JOHN C. HIRST.—A case of primary abdominal pregnancy was reported some time ago to the Society. It had been operated upon in the Maternity Hospital of the University. The case was investigated by a Committee appointed by the Society. The specimen was studied microscopically. My impression is that the tube on the side corresponding to the location of the ectopic was removed. The report of the Committee was that the case was one of primary abdominal pregnancy. There was no microscopic proof of attachment of this gestation in the tube.

DR. CONAWAY, closing.—I think Dr. Williams has proven the value of conserving the opposite tube and ovary. Of 140 cases, fifty-eight have been traced of women who subsequently gave birth to

children. We owe it to the woman to give her every chance to have a full-term pregnancy.

DR. WILLIAMS, closing.—Of the two cases when death occurred from hemorrhage, the first patient died about thirty hours after operation, gradually developing increasing pallor. The second patient had a secondary hemorrhage with death two days after operation. The primary abdominal pregnancy was reported several years ago by Drs. Knipe and Hirst before this society.

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## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON OBSTETRICS AND GYNECOLOGY.

*Meeting of January 23, 1913.*

GEORGE GRAY WARD, Jr. M. D., *in the Chair.*

#### OPERATION FOR MARKED DESCENSUS OF UTERUS BY THE DÜHRSSEN-BANDLER METHOD.

DR. SAMUEL WYLLIS BANDLER presented this patient. She was forty-seven years old, with descensus of the uterus, that organ protruding beyond the vulva on pressure, and was associated with a very large cystocele, a decided enterocele and rectocele, with complete absence of any perineal body. This patient was operated on before the Surgical Congress by the Dührssen-Bandler method. In addition to the vaginal fixation of the fundus of the uterus to the anterior abdominal wall, made with the aid of an inverted "T"-shaped incision, there was a very high amputation of the cervix, a sewing of the posterior fornix and the pelvic connective tissue around the new external os in such a way as to diminish the diameter of the anterior and posterior fornix. As a result of this a considerable area of the anterior vaginal flaps was removed. The next step consisted of a resection of the posterior vaginal wall in its entire length and this was followed by the Bandler form of perineorrhaphy, which included three buried chromic sutures to unite the levator ani muscles of the two sides in front of the rectocele, and anchoring of the posterior vaginal wall at this point. The perineorrhaphy was complete by a figure-of-eight stitch which served to bring the raw surfaces together in the middle line.

The Chair then appointed a Committee to examine the patient, who was in an adjoining room, and to report back to the Section their findings.

DR. HERMAN J. BOLDT said that so far as the results were concerned they were perfectly satisfactory. This patient had come to him at his clinic, had been admitted to his service, but had been turned over to Dr. Bandler. She had an exceptionally large cysto-

cele. The entire wall with part of the bladder protruded out of the vulva, the mass being as large as a small orange. Before the patient was turned over to Dr. Bandler, Dr. Boldt had suggested doing a cystocele operation and after that an abdominal operation. There was an absolutely perfect result so far as the cystocele operation was concerned—it would be impossible to get a better result. But he did not consider that she had a prolapse of the uterus when he examined her. It was only a moderate descensus.

#### DISCUSSION.

DR. THOMAS SWEENEY said that the operation performed by Dr. Bandler seemed to have entirely removed the cystocele but the fundus of the uterus rose higher in the abdomen than it did after the Dührssen operation. The vagina seemed to him to be a little shortened.

DR. FREDERICK C. HOLDEN said that his findings coincided with those of Dr. Boldt and Dr. Sweeney. There was a firm pelvic floor and the cervix was well backward in the hollow of the sacrum.

DR. BANDLER then reported a series of cases.

#### CASE OF ECTOPIC GESTATION OPERATED ON BEFORE THE SURGICAL CONGRESS.

A patient who had an ectopic gestation with only a slight hema-tocele. She had a mass on the right side of the uterus about the size of the fist. The diagnosis was tuboovarian inflammation, probably cystic. When examined under anesthesia the mass seemed to be harder, and as the fingers applied over the abdomen were pressed down, they passed between this mass and the uterus, and the separation of little tiny fine bands, which yielded to the pressure, was distinctly felt. Dr. Bandler considered this decidedly in favor of an ectopic mass. A possible diagnosis of dermoid was made and operation was performed vaginally. Although there was little free blood in the peritoneal cavity, the typical bluish shimmer was present as soon as the vesicouterine fold of peritoneum was reached with the aid of the "T"-shaped incision. Even then ectopic gestation was referred to rather in a doubtful way. On entering the peritoneal cavity a few little black clots were seen. The tube was taken hold at the uterine end and by a sponge holder; as it was drawn out into the vagina the outer end, with its enlarged ovary, forming a continuous mass, impinged against the anterior speculum, and it was impossible to bring the large tumor more distinctly into view. The appearance of the mass, therefore, showed it to be a tube filled with hard clotted blood. The dressing forceps perforated this outer end of the tube to permit some of the coagulated contents to be expelled, and thus diminish the size of the mass. Clamps were applied to the edges of this perforation and they gradually brought the large ectopic mass into the vagina, when its removal was a matter of ease.

## ECTOPIC GESTATION WITH HEMATOCELE.

A woman, twenty-two years old, para-i, two and a half years before admission began to complain of cramp-like attacks in the right iliac region, occurring once in three or four months, lasting two or three hours, more frequent and severe in the last year. The last attack, three days before admission, was more marked than usual. Her last menstruation was a little more than four weeks before admission. Colostrum was present and no mass could be felt in the abdomen. The cervix was small and soft. The fundus of the uterus could be distinctly felt forward. In the right fornix a smaller and a larger tubular mass, very tender, was present. The patient was very obese and the abdomen was very rigid. The definite diagnosis was made under anesthesia. In this case the plica showed a typical blue shimmer which was an important diagnostic aid in ectopic gestation. An incision into the plica verified the diagnosis; large dark clots and some dark fluid blood poured out. As much as possible was removed with sponges, the uterus was turned so that the right horn was in the median line, and the fingers of the right hand enucleated the enlarged tube from the hematocele. The tube was brought into view by the application of clamps to the uterine end and to the ovarian ligament, after which a clamp was applied to the ligamentum infundibulo-pelvicum. Then three ligatures were applied about the ligament, the tube removed, but the ovary was left behind.

## ECTOPIC GESTATION WITH HEMATOCELE.

The patient was twenty-two years old, i-para, over three years ago. Her menstruation was expected on November 18. Two days following the expected period she was seized with a sharp cramp-like pain in the lower part of her abdomen which lasted a day, and was followed by bleeding. Since then she had had more or less pain all the time and had bled some. Two days before admission she vomited for the first time, felt faint but did not faint. She did not look pale. There was no colostrum. There was tenderness in the right iliac fossa, the cervix was hard, fairly movable and the uterus was enlarged and slightly movable. A cystic mass was felt per vaginam; it was about the size of a lemon and was continuous with a similar mass which filled the culdesac of Douglas and extended to the left side. There was a large hematocele surrounding a firm tube; this was clearly noted on examination under anesthesia before the operation. The hematocele was as large as a child's head and a posterior vaginal incision was made on completion of the operation for drainage. In this case as well there was present the typical blue shimmer which he had so far observed in every case of ectopic gestation operated on per vaginam.

## DISCUSSION.

DR. HIRAM N. VINEBERG said that it seemed to him that this question had been thrashed out long ago and that over in Germany



when this vaginal route was so much in vogue it had been concluded that the better way to treat these cases of ectopic gestation was through the abdomen. Anyone who had had experience in this work, both abdominal and vaginal, realized the advantages of the former route, in almost every case. They were dealing with a friable ligament and tube and one that was easily ruptured. A great deal of manipulation the broad ligament would not stand for. Even in working through the abdominal route one should be very careful in tying off the ectopic tube and should be very careful not to injure the broad ligament. Dr. Vineberg had seen cases resulting in death, and in the hands of very good men; they operated through the abdomen but were not as careful in their manipulations as they might have been. A slight tear had been overlooked and the patient bled to death from oozing from the tear in the broad ligament. In the majority of instances it was unnecessary to sacrifice the ovary and surely it was more easy to save the ovary when the tube has to be removed when operating through the abdominal route.

The vaginal route is of service in one class of cases, when the patient is stout, the symptoms not very definite and the local findings negative. But here, all that is necessary, is to make a small transverse incision posteriorly, in the fold revealed by pushing the cervix toward the sacrum, and in less than a minute, we can ascertain whether there is free blood in the peritoneal cavity. Having thus ascertained the presence of a ruptured or aborted tubal pregnancy, we make a suprapubic incision and attend to the condition in a surgical manner. This incision has the advantage over the anterior incision, advocated by the speaker, firstly, in that it reveals a smaller quantity of blood, for whatever blood is effused, naturally sinks into Douglas' culdesac, and secondly, that it is much more simple and is attended with, practically, no traumatism. Every operator knows that to separate the bladder, fully from the cervix, is not the insignificant matter, the speaker would lead us to believe, and that such a separation is likely to be attended with considerable bleeding and bladder disturbances, later on. Then after we have pushed up the bladder and exposed the uterovesical fold, to complete the operation by this route, calls for dangerous traumatism to the uterus, and to the broad ligament, as was evidenced by Dr. Bandler's own description of the steps of the operation, in his cases. Dr. Bandler laid great stress upon, what he called, the inverted T incision. This was the incision employed by Dr. Vineberg, when he first introduced the operation into this country in 1894, but he employs it rarely now, as in suturing the edges of the transverse arm of the T, there is likely to be sloughing of the distal part of the mucosa, or that part extending to the os externum, inasmuch, as the blood-vessels are distributed in such a manner that the blood supply of that part of the vaginal wall is interfered with. Further, the longitudinal incision, unless the uterus is to be removed, serves all legitimate purposes of exploration, or surgical treatment of the adnexa.

DR. BOLDT said that there were some instances of extrauterine pregnancy where it seemed desirable to do the vaginal operation, and particularly in that class of cases where one was uncertain as to the diagnosis. It was an easy matter to make an opening there for diagnostic purposes, but he asked what was the practical advantage? The patients were in bed as long, their recovery was as long, and there certainly was more risk of secondary infection. Dr. Boldt thought that the ground was well taken that the abdominal operation was to be preferred in most cases of ectopic gestation.

DR. BANDLER.—I have always been conservative in the use of the term "total prolapse," reserving that phrase for cases extending several inches beyond the vulva. The term "descensus of marked degree" means that the cervix is visible beyond the vulva, but on extreme pressure extends well beyond it. As the title shows this was a case of marked descensus, and is not the case which Dr. Boldt has in mind. Dr. Boldt saw me operate on this case, as he probably now recalls, in the amphitheatre of the Post-Graduate before the Surgical Congress.

In answer to Dr. Vineberg, let me say that there are very good reasons why the anterior route should be preferred to the posterior. Of course, when there is a large mass in the culdesac of Douglas, we simply have to puncture with a long pair of scissors, open them out, and the clotted blood pours into view if we are dealing with an hematocele. But in the other cases, where we are dealing mainly with the products of conception still in the tube, or with very early cases, the posterior incision is of no value. Firstly, it bleeds rather profusely, and when we enter the peritoneal cavity it is hard to tell whether fresh blood is coming out from within the peritoneal cavity or from the edges of the incision. Secondly, one cannot look into the peritoneal cavity, into the pelvis, and see with what we are confronted. None of these objections holds good by the anterior route. There we make a simple transverse incision, usually combining with this a longitudinal vaginal incision in the anterior fornix. The bladder is readily separated, and in the several hundred cases which I have done in this way, I have never injured the bladder. When an anterior speculum is now introduced, the bladder is lifted up, and the vesicouterine plica is beautifully exposed to view, and if there is blood there we see the typical blue shimmer. One needs to go no further, since the diagnosis has been made, the incisions are closed and the operation may be proceeded with by the abdominal route. If one is not sure of the diagnosis, or if one wishes to go further, the peritoneum is picked up by forceps and is incised transversely, an anterior speculum is now introduced into the peritoneal cavity and one sees with the eye intestine, omentum, both tubes, both ovaries. One may introduce his finger, palpate them, and bring them into view, and in this way, with the aid of sight, the existence of an ectopic gestation is verified or disproven. If then the abdominal road is selected for completing the operation, the incisions are closed and at the most five minutes have been consumed. If no ectopic gestation is present, the patient is spared an abdominal operation. If

an ectopic gestation is present, and there seem to be no difficulties to going on with the operation through the vaginal incision, there is absolutely no reason why it should not be done, and the patient is spared the abdominal operation.

I do not mean to advise the vaginal route for all cases. I myself operate on more than twice as many cases by that path, but I do hold that in early cases or cases where the diagnosis is not clear, or where there is no active bleeding going on, and where the vagina is roomy, as in parous women, this method is of extreme value for diagnosis or for operation, and it has from either of these standpoints decided advantages over posterior vaginal incision.

DR. BANDLER then reported several more cases, as follows:

FIBROSIS UTERI, VAGINAL HYSTERECTOMY, LIGATURE METHOD.  
AUTHOR'S METHOD OF PREVENTING CYSTOCELE.

The patient was thirty-eight years old, vi-para, last child six years ago. A year before admission menstruation began to come on every two or three weeks, lasting six or seven days, profuse in amount, and with dull aching pain in the pelvis. She also had frequent micturition. The uterus at operation was found to be moderately enlarged, and ovaries more than twice their normal size, with an appearance of hypersecretion. The uterus was removed by the ligature method, and the tubes and ovaries were left in place. The stumps of the broad ligament were anchored to the corresponding vaginal flap of vaginal mucous membrane to prevent future cystocele. After the peritoneum had been entered anteriorly by the "T"-shaped incision and after the posterior fornix had been transversely incised to enter the culdesac of Douglas, the lateral walls of the cervix were exposed by pushing the vaginal mucosa upward, and two chromic ligatures were passed with the ligature carrier, one on either side, including the lower part of the broad ligament and the uterine arteries. The scissors cut between these two ligatures and the cervix until the uterine arteries were exposed when each was tied off separately. Then the fundus of the uterus was delivered and the broad ligament was ligated from above down by three chromic ligatures applied median to the ovary, no attention being paid to the tube and ovary whatsoever unless diseased. The scissors then cut away the fundus from the broad ligaments down to the previously cut uterine arteries. The ligatures which thus embraced the entire broad ligament were then drawn out so that the broad ligament stumps were in the vagina. Gauze was packed between them to keep intestine and omentum out of the way and anterior retractor kept the bladder out of the way and then a heavy chromic suture was passed which united the vaginal flap of either side, the vaginal mucosa which had been removed from the latter wall of the cervix and part of the vaginal wall of the posterior fornix, to the entire broad ligament of that side, the suture passing through the ligamentum ovarii or the upper part of the broad ligament, and the peritoneum of the posterior wall of the broad ligament, and the peritoneum of the culdesac of Douglas.

When this was tied on either side, each broad ligament was completely enveloped by vaginal mucosa, and the opening between the sides had been narrowed. This opening was further narrowed by interrupted sutures applied along the posterior margin of the incision; then the peritoneal cavity was packed with gauze, removal of which was begun on the fifth or sixth day and completed on the tenth or eleventh day. The vagina was likewise packed with gauze. For two days there was considerable serosanguinous oozing.

VAGINAL HYSTERECTOMY (CLAMP METHOD) WITH AMPUTATION OF  
THE UTERUS AT THE INTERNAL OS DURING THE COURSE  
OF THE OPERATION.

The patient had continued menorrhagia for several years due to several interstitial fibroids situated in the fundus of the uterus. Very little hope was held out of the probable favorable conclusion with a conservative myomectomy. With the aid of an inverted "T"-shaped incision, the bladder was separated from its contact with the cervix and uterus, and from its relation to the anterior vaginal wall, the longitudinal incision extending up to the urethral prominence. A posterior vaginal incision was made, the culdesac of Douglas entered, two clamps being applied to unite the peritoneum with the edge of the vaginal incision. An anterior speculum was then introduced, and the vesicouterine plica was incised widely. The anterior retractor was then introduced into the peritoneal cavity and with the aid of successively applied volsella, the uterus was brought into the vagina. Before the uterus was delivered, however, two clamps had been applied to the lower part of the broad ligament. The application of these clamps made it difficult to bring the fundus down as far as it was possible when the cervix was freed of the clamps, so that there was little room anterior to the uterus. Two broad ligament clamps were applied on the left side and with the aid of scissors the uterus was separated almost to the level of the internal os. This area owing to the angulation of the cervix produced by the first clamps that were applied from below, was a little removed from a clear view and, in addition, at this point a small fibroid was present, so that a transverse incision was made at the level of the internal os completely separating, or amputating, the fundus from the cervix. Then the right side was clamped and separated down to this transverse cut leaving the cervix still within the grasp of the two clamps first applied. It was then easy to see that only a small area of tissue still needed to be separated, and the little fibroid on the left side was enucleated without any damage. The connecting bands of tissue were cut through and the cervix was removed. A few interrupted sutures diminished the size of the vaginal opening anteriorly and posteriorly. A chromic catgut suture fastened each flap to the upper border of the broad ligament of its corresponding side. Two wide strips of iodoform gauze were introduced into the peritoneal cavity, and another strip in the vagina so as to protect the latter wall from the pressure of

the clamps, and the clamps were surrounded with gauze and supported by a strip of plaster. The clamps were removed at the end of forty-eight hours, the vaginal gauze in five days, the intraperitoneal strips a few inches each day, so that by the tenth day douches could be begun. The patient made a good recovery.

VAGINAL HYSTERECTOMY (CLAMP METHOD) INCLUDING LEFT SAL-  
PINGOOPHORECTOMY FOR TUBOOVARIAN ABSCESS: BISECTION  
OF THE UTERUS.

The patient was forty-four years old, iv-para, last child twelve years ago. She had one abortion ten years ago. She had marked menorrhagia for the last six months. During the last three months she had had menorrhagia and metrorrhagia with weakness, pain in the pelvis, and loss of weight. She was pale and poorly nourished. The uterus was larger than normal. With the use of the "T"-shaped incision the uterus was found adherent to the posterior pelvic wall, and was pretty well surrounded by adhesions over the fundus. These were separated by blunt dissection with the finger and gauze. In the anterior wall of the uterus was a fibroid somewhat larger than a walnut. The uterus was divided in the median line without the loss of any blood. The right half of the uterus was pushed up into the peritoneal cavity and the first two fingers of the left hand were used to separate the adhesions and to enucleate the left adnexa, consisting of a large tuboovarian mass surrounded by many adhesions. This mass was punctured to allow some of the content, which was purulent, to escape. Clamps were applied on the left side to include the tuboovarian mass. On the right side only the uterus was removed, there being no marked change in the adnexa. She was operated on November 26, the clamps were removed November 28, and the last gauze removed December 12.

VAGINAL HYSTERECTOMY. MORCELLEMENT AND CLAMP METHOD.  
BISECTION OF THE UTERUS. TWELVE FIBROIDS.

The patient was fifty-five years old and had been under his care for three years for pronounced menorrhagia associated with pain on the right side. The patient was extremely obese and it was impossible to make out the exact contour of the uterus, but the sound showed it to be two and a half times the normal length. Bimanual examination showed on the right side, on a level with the internal os, an intraligamentous fibroid the size of a tangerine, and one nearly as large just above the culdesac of Douglas; another was anterior and one or two others higher up. Various measures used locally, together with internal medication, served at times to diminish the annoyances, but gradually the patient's bleeding became so marked that it would last in profuse amounts for two weeks in spite of packings, hot douches and internal medication. The patient was anxious to be relieved and the choice existed between a curetage and a

hysterectomy. An abdominal hysterectomy was excluded because, with such an obese patient, the intraligamentous fibroid and particularly the fibroid in the culdesac of Douglas, would have made the latter part of this operation of complete hysterectomy extremely difficult and dangerous. The patient had a decided rectocele and the vault of the vagina was not very wide, nor could the cervix be drawn down far. Simple curetage, as subsequent operation showed, would have been of no value, and he elected to do the vaginal operation. Anteriorly an inverted "T"-shaped incision was made. The separation of the bladder showed in the anterior wall a fibroid as large as a crab apple. A transverse incision was made posteriorly and the posterior vaginal wall was dissected away up to the culdesac of Douglas where the fibroid lay fixed between the uterus and the rectum, making it impossible to enter the peritoneal cavity at this point. It was this fibroid and the firmness of the ligamenta cardinalia, together with the intraligamentous fibroid of the right side, which made it impossible to bring the uterus well down. The cervix was then grasped by two Jacobson forceps on either side and the cervix was split in two, anteriorly and posteriorly, up to the respective fibroids. The bladder was held out of the way by an anterior speculum and the splitting was continued anteriorly, the inner border of the two halves of the cervix being likewise grasped by Jacobson forceps. With the blunt scissors and the finger, the anterior fibroid, having been first grasped by a volsellum, was enucleated. It was impossible to bring more than a slight area of the anterior body of the uterus into the field of operation, because the fibroids, intramural and subperitoneal, made it too large and because they impinged upon the speculum. The splitting of the posterior wall of the cervix was continued and a volsellum grasped the culdesac fibroid. Then, with the aid of a blunt dissection by the finger, that too was enucleated. Then the anterior wall was attacked, the splitting being continued up a little further, the two halves of the uterus being grasped, and successive fibroids enucleated. The intraligamentous fibroid on the right side was so close to the situation of the ureter and uterine vessels that it was attacked in the following manner.

A transverse cut was made through the anterior wall of the right half of the uterus from the median area close up to its outer border, and then the finger bored its way to the fibroid which was grasped with the volsellum. A blunt-pointed pair of scissors dissected this mass gradually from its surroundings; the more it was separated the deeper was the area which was grasped, and the more clearly did it come into the field of operation. The index-finger aided in this blunt separation and in this way the most deeply buried part of the circumference was finally brought into view, and every stage of the early and final steps of the enucleation had been accomplished practically with the aid of the eye. Then by morcellement the lateral walls of the uterus were resected, so that gradually the fundus came into view and more fibroids were enucleated. The splitting was continued in this wise over the posterior wall until



the cutting ended in a longitudinal slit that had been made in the posterior wall of the cervix. The peritoneum of the culdesac of Douglas was still intact, showing that the posterior fibroid had been retroperitoneal. Two broad ligament clamps had been applied to the lower area of the uterus along the cervix and, with the aid of scissors, the two halves of the cervix had been separated up to the area just above the uterine arteries. Two clamps were applied to the upper part of the broad ligament median to the ovary, and this part of the fundus was removed on either side. The middle area of the right half of the uterus through which the intraligamentous fibroid was removed had attached to it several clamps which had been applied while the morcellement of the uterus was taking place. These were left *in situ*. The same condition was encountered on the left side, where likewise in the median area several clamps and volsella had been applied. As much as possible of the uterine tissue along the lateral border was trimmed away. The peritoneal opening was packed with three strips of iodoform gauze. The vagina was packed with iodoform gauze. The clamps were removed at the end of thirty-six hours and without disturbing the patient. The vaginal gauze was removed at the end of five days and from then on intraperitoneal packing was drawn out a few inches each day until it was all removed. Vaginal douches were then begun which brought away for several days various sloughs of necrotic tissue, namely that portion of the lateral uterine wall embraced by the various clamps. The patient made a smooth recovery with only slight symptoms of peritoneal irritation. One of the most annoying factors in the course of the operation was the very extensive rectocele which persisted in intruding itself into the field of operation beyond the end of the posterior speculum, and was a constant source of annoyance. The use of clamps of course precluded the possibility of doing a perineorrhaphy at the same time.

DR. JOHN VAN DOREN YOUNG presented the records of a number of cases.

#### CASE I. HYDRONEPHROSIS CONTAINING EIGHT QUARTS OF FLUID.

L. W. thirty-eight, single, silk weaver. Menstruation began at thirteen, regular, duration three days, no pain, normal in amount.

General health has been fair. For fifteen years she has worked at her occupation and practically never been ill, except that during this time she has suffered with pains in right side, referable to appendical region. The attacks were severe and accompanied by gastrointestinal disturbances. I was unable to obtain any history referable to bladder or kidney, either from herself or from her physician. Does not exactly remember when she first noticed enlargement of the abdomen, but is sure that it has been the present size for over five years. She complains of no particular pain except dragging and weight of the tumor, also its inconvenience. She says she was always strong and able to do her work. Lately, however, she has

begun to notice that she tires easily, and the tumor is of greater annoyance to her.

She is rather spare of build, fairly well nourished; heart, lungs and kidneys negative. No edema. Examination of the abdomen shows a mass filling the entire abdominal cavity from the symphysis to the free border of the ribs. The outline of the tumor is that of a full-term pregnancy. Percussion note is dull over the entire abdomen, except on the left side where the note is tympanitic. There is a sausage-shaped bulging felt along the crest of the ileum and running downward toward the medium line. Percussion throws fluid wave in all directions and is felt through the vagina on tapping above. No pain or tenderness elicited. Uterus is retroverted and pushed downward by the mass. *Diagnosis*, large ovarian cyst of right ovary.

Operation, December 2, 1912, at St. Elizabeth's Hospital. A median, long, highly placed incision was made. A large cyst was found filling the abdomen. Examination disclosed the appendix and ascending colon together with remainder of the intestinal tract in the left side of the abdomen. The tumor seemed to spring from the posterior abdominal wall and to be retroperitoneal. Upon lifting the mass upward, uterus, tubes and ovaries were found normal. Large vessels were seen under the peritoneal covering of the cyst. Selecting a clear space, the wall of the cyst was grasped by Kocher clamps, a large trocar introduced and over eight quarts of opalescent yellow fluid was drawn. An incision was then made in the peritoneum, and the sac pulled up, which was in turn incised large enough to admit the hand, which entered a sacculated cavity extending to the location of the right kidney. The ureter was then made out, not dilated, was ligated and cut low down. I found and ligated the renal vessels, which presented a very normal appearance. I then decided to attempt the removal of the entire sac which was accomplished relatively easily by blunt dissection with the finger covered by gauze. A puncture was then made in the lumbar region, and two large drainage tubes inserted. The wound of the posterior peritoneum was then sutured and the abdomen closed in the usual manner.

The patient made an uneventful and smooth recovery. Highest temperature 100  $\frac{3}{5}$ ; highest pulse 108. Amount of urine secreted was on December 3, after operation, 8 ounces; December 4, 24 ounces, December 5, no record; December 6, 32 ounces.

Patient left the hospital January 5, 1913, well.

Examination of the urine made by Dr. Wm. McM. Higgins: December 7, shows a marked trace of albumin, indicanuria, and acetonuria, with a few hyaline casts. Specific gravity 1.025.

March 12, 1913. Patient has gradually regained health and strength and is now able to return to her usual occupation.

The following pathological report confirms the diagnosis of hydronephrosis.

"Sections taken from different parts of the cyst wall present in general the same appearance and resemble in some degree the

tissue not infrequently seen in an old cirrhotic kidney. The tissue consists of fibrous tissue at base and is fairly well supplied with blood-vessels, most of them small. In some parts the fibrous tissue is infiltrated to a moderate degree with small round cells. In some sections the fibrous tissue is the predominating element; in others there are quite a number of small oval or round spaces and short tubules lined with flattened epithelium. Some of these are filled with coagulated blood, others with hyaline matter. Scattered through these sections are many fibrous tufts. In other sections there is occasionally seen a glomerulus or tuft somewhat larger than is seen usually in normal renal tissue but with the structure still well defined.

"Sections taken from the tubular structure show the tube to be made up of two muscle coats supporting a mucous membrane of stratified epithelium. That is, the segment proves to be part of the ureter. The fluid received with the specimen was similar in appearance to urine, of slight alkalinity, high albuminous content, with urea absent and microscopically was negative. The amount received was too small for a more detailed examination.

"Diagnosis: Hydronephrosis.

#### CASE II. DEPRESSED FRACTURE OF THE ACETABULUM.

Mrs. S., thirty years old. Was injured in an automobile accident April 24, 1912, in San Salvador, C. A. The machine turning over, the patient was thrown to the ground on her left side, the back of the rear seat striking the right hip. From the nature of the injury, it is apparant that the blow must have been directly over the greater trochanter and directly in line with the neck and head of the femur. The machine was a heavy one, weighing 2,300 pounds. Patient was under the machine for some time before sufficient help arrived. Patient was carried some six miles to San Salvador where she remained for seven weeks under the care of Dr. Manuel E. Araujo, Dr. Guillermo Trigueros, and Dr. Federic Yudice who made a diagnosis of fracture of the pelvis from a clinical examination and x-ray. The first examination was made under chloroform. Two days later, there being a very considerable shortening of the leg, she was given chloroform a second time and traction made on the injured leg. A spica extending from the waist to the right knee was made of rolled tin, properly padded with a broad belt. On the fifth day it was decided to try the effect of a Buck's extension for the shortening. The pain was so great that she was unable to wear it and three days later it was discontinued. The splint was continued for twenty-three days at the end of which time it was removed. Four weeks after the injury she was allowed up on crutches and walked on crutches until July 24, when she was able to walk with a cane. Fears were entertained of bladder injury immediately after the accident. September 17 patient applied to me. I found her walking with considerable difficulty and pain. She was not able to sit still for more than half an hour without the most severe pain. Her

general condition, although it had improved much since the accident was still poor. Diagnosis of fracture of the pelvis was confirmed and the accompanying radiograph shows very clearly the deformity. The head of the femur, together with the acetabulum had been driven inward 3.5 cm. and upward 2.5 cm. The joint surfaces were apparently not injured.

The stereoscopic picture taken by Dr. Leon T. LeWald showed the deformity very beautifully. (See Fig. 1.)

On October 2, the patient was seen by Dr. Russell A. Hibbs who found about an inch and one-half shortening and a limitation of all motions. This limitation was 50 per cent. in all directions.. He advised against an operation and stated that in his opinion the problem could best be solved by teaching her exact muscular exercise as the ordinary muscular coordination was entirely disturbed and it was necessary to substitute a new coordination that would become normal for the altered relationship and eventually become automatic.

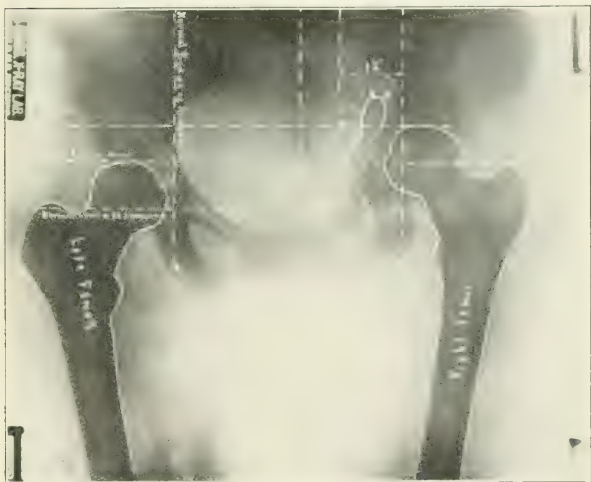


FIG. 1.—Depressed fracture of acetabulum.

Dr. Hibbs took this side of the case entirely in hand and under his supervision the patient has completely regained her muscular power and is able to walk two miles without fatigue, the sacral pain has entirely disappeared and she is practically a normal person.

The case is of particular interest on account of the unusual nature of the fracture and the complete recovery. The bony deformity would, in my opinion, present a serious obstacle to delivery.

## CASE III. UNUSUAL SIGMOIDAL LOOP.

Mrs. G., age thirty. One child four years. Beginning at the age of sixteen she began to suffer with periodic attacks of what was un-



FIG. 2.—Unusual sigmoidal loop.

doubtedly intestinal stasis, very marked loss of weight, highly nervous, and severe dysmenorrhea. The exact cause of the dysmenorrhea is obscure. At the time it seemed that her poor health was due to dysmenorrhea. It is more than probable that the reverse was the fact. These attacks continued at intervals of a year

for about nine years. After each attack a long period of rest would be followed by improvement. During one severe attack she lost 25 pounds in weight which she regained. After marriage, five years ago she was well until one year ago. About ten years ago her appendix was removed for an acute appendicitis. After the attack of a year ago, the patient's condition was truly wretched. In searching for the cause of the intestinal stasis, x-ray photographs taken by Dr. Leon T. LeWald, showed a marked degree of gastropnoxis, with a stomach of the water-trap type. Gastric retention of bismuth meal, seven hours after taking, moderate in degree.

Well-marked colonic stasis was found and in searching for cause the unusual sigmoidal loop was found which is shown in the accompanying x-ray photograph, which shows the position of the colon particularly well, with the sigmoidal loop extending above and behind the transverse colon and above the umbilicus. (See Fig. 2.) She has been under medical care, which includes postural treatment and a carefully regulated diet. Last October, Dr. Thomas R. Brown of John Hopkins' fitted her with an elastic belt, and an inflatable abdominal pad which she wears constantly.

By percussion, the stomach seems slightly lower than normal in position, but well above the umbilicus. All her symptoms have disappeared and she has gained 12 pounds in weight.

The question naturally arises, will her improvement be permanent if the stasis is caused by this loop or will it be necessary in the future to operate? It is my opinion that at present, surgical interference is unwise, and should only be done if the future development of the case warrants it.

With the perfection of the technic in intestinal photography, it will be interesting to note the number of these cases that may be reported. It is also interesting to observe the marked improvement following medical treatment, in this case and in the fourth case.

#### CASE IV. GASTROPTOSIS.

Miss D. Age forty-eight; single. Father died of cancer.

Menopause one year ago. Seven years ago had curetage for dysmenorrhea. Appendix removed eight months ago; applied to me last May suffering from intestinal stasis; weight 93 pounds; right floating kidney; x-ray photographs of stomach show greater curvature 3 inches below umbilicus. Bismuth meal retained after six hours. Transverse colon at the brim of the pelvis. Vaginal examination showed ovarian cyst 11 cm. in diameter wedged in the culdesac. I decided to remove the ovarian cyst as a possible cause of stasis and see what benefit could be derived from medical treatment afterward. September 11, 1912, I operated at the New York Polyclinic Hospital. Patient made an uneventful recovery and left the hospital weighing 93 1/2 pounds. While in the hospital I kept her in the Trendelenburg position most of the time. January 11, her weight was 98 pounds with marked general improvement and increase in vitality. She



was able to return to her work. Since the 20th of last May she has remained on a diet of lactic acid milk. The medical treatment has consisted of diet, postural treatment, exaggerated Trendelenburg, Goldthwaite position, vibratory massage and abdominal belt with pad, and some medication. I fully believe that if this patient had not had to go to work that her recovery would have been much more complete, although she is now able to attend to her duties as a private secretary and has a large amount of energy. Her weight at present is 99  $\frac{3}{4}$  pounds. In this case, the question of operative interference was a very grave one, but I feel sure that the improvement, although it is slow, warrants the continuation of the medical treatment.

#### CASE V. DOUBLE OVARIAN PAPILLOMA.

Patient R. L. Forty-five years, widow. Was operated on fourteen years ago for laceration of cervix and perineum. Six



FIG. 3.—Papilloma of ovaries.

and one-half years ago I saw her and there were no growths of any sort in the pelvis. She has lost 29 pounds in two years. Pains in the abdomen for the past six months. Bladder began to be irritable two years ago; one month ago was treated for cystitis. When I saw her July 11, 1912, my diagnosis was retroverted uterus with multiple cysts of both ovaries of large size. Operation at the Polyclinic Hospital, July 17, 1912.

The usual median incision was made. On opening the peritoneum, a large amount of ascitic fluid escaped. Both ovaries were found to be cystic and each about 5 inches in diameter. Covering these cysts were papillomatous growths. The papilloma were adherent to all the adjacent structures, the adhesions separated easily. Numerous small papilloma were seen on the bladder, peritoneum of the anterior abdominal wall, and the intestines. These were removed as completely as possible. After removal of the large growths, the uterus was found to contain numerous small fibroids and was removed by supravaginal hysterectomy.

The patient made an uneventful recovery and has remained well since. The prognosis is, in my opinion, one which should be guarded as the danger of recurrence would seem to be great. The macroscopical diagnosis was confirmed by a section made by Dr. F. M. Jeffries, pathologist to the Polyclinic. The character of the growths is well shown in the accompanying photograph. (Fig. 3.)

#### DISCUSSION.

DR. HIRAM N. VINEBERG asked Dr. Young if the cyst was lobulated. On account of the enormous size of the cyst it occurred to him that there might have been a cystic degeneration of the kidney, one known as polycystic degeneration, and which usually affects both kidneys. He was reminded of a case he had during the summer. The woman had an enormous abdominal cyst, which was causing pressure symptoms, so that the patient suffered from difficult breathing. After freeing the cyst for the greater part, it was ascertained it was a huge polycyst of the right kidney. No other course was open but to remove it. It was then learned that the remaining kidney, likewise, presented polycystic degeneration, but the cystic mass was only half the size of the removed one. The patient died in about twelve days after operation from symptoms of urea retention. On inspecting the removed specimen, it was difficult to conceive how it could in any way have contributed to the elimination of urea products and, still, it must have done so, judging from subsequent events.

In reference to Dr. Young's case, DR. HERMANN GRAD reported a case of a patient who was admitted to the hospital in a very bad condition, with high temperature and tenderness over a large abdominal tumor. The patient lived but a few days and at autopsy there was found a hydronephrosis which entirely filled the abdomen; it was a cystic kidney on the right side. The left kidney had entirely contracted and useless functionally it was likely that all the secretion of urine must have come from the diseased kidney. This patient died of uremia. It seemed that the diseased kidney had been functioning while the other did not.

DR. JOHN VAN DOREN YOUNG, in reply to Dr. Vineberg's question, said that this was a true hydronephrosis, and not a case in which there were separate cysts.

DR. H. J. BOLDT reported several cases.

On December 5, 1912, the patient aged thirty-three years was seen through the courtesy of her physician in order to determine whether she was pregnant. Her only child was born ten years previously. She had always menstruated at regular intervals of four weeks, the flow lasting from three to four days, and during the period she had pain in the left iliac fossa. Her last previous menstruation was on September 20.

Since November 1 she had now and then slight spotting resembling a dark leukorrheal discharge, but she distinctly stated that it was not blood, nor did it have any resemblance to blood. There were no other subjective symptoms. The uterus was slightly enlarged and softer than normal. Otherwise the pelvis was negative. No colostrum in the breasts. The diagnosis of pregnancy was made with a ? on my history card. On December 30, I was requested to see her at her home with the doctor. The history was that at four o'clock on the morning of the 19th, when on the toilet, she had an attack of severe pain in the lower abdomen and fainted. From that time on she was kept in bed, and now and then had intermittent pain in the lower abdomen. She was treated, until the time when again seen for gastrointestinal disturbance. *At no time was there any loss of blood.* The history was now quite clear of an ectopic gestation, and this was verified by the presence of a pelvic hemocele. She was then entirely free of pain. Her removal to the Post Graduate Hospital was ordered, and on January 1, she again having some pain, was operated upon, and, by special request of the doctor, the operation was done per vaginam, through the posterior culdesac. After evacuation of a moderate quantity of blood the introduced hand came in contact with the placenta on the left side; it was loosely adherent to the intestines, and was readily separated. Following the cord, a three months' fetus was found behind the right broad ligament. Again introducing the hand, it was found that the left Fallopian tube was drawn upward and its fimbriae loosely attached to the bowels.

This accounted for the negative palpation finding at the time of the first examination. The ampulla was somewhat dilated, but otherwise nothing abnormal was found to induce Dr. Boldt to remove the tube, particularly since the woman had had only one child. Gauze drainage. Convalescence uneventful.

The points to which attention is directed are: The woman probably conceived during the latter part of September, but, with the exception of suppressed menstruation, no subjective symptom presented itself until December 19; likewise, because of the dislocation of the tube, no objective symptom, except the moderate uterine change was perceived on December 5, although the woman was then already about nine weeks pregnant.

Regarding vaginal section in such cases, Dr. Boldt does not believe that it should be the method of choice, except under favorable circumstances, despite the fact that a satisfactory outcome was obtained in this instance.

MYOMATOUS UTERUS, COMPLICATED WITH SUPPURATING OVARIAN  
CYST ON THE RIGHT SIDE, TUBOOVARIAN ABSCESS ON THE LEFT,  
AND CHRONIC PELVIC PERITONITIS. ORGANIC HEART  
LESIONS.

S. B., aged forty-five years, had been bleeding profusely for two months, but had declined to be examined by her family physician until it was evident to her that she was losing ground.

The lower part of the abdomen was filled by a tumor which was evidently adherent to all parts of the pelvis. It was clear from the examination that a myofibromatous uterus was present, and that it was probably submucous was surmised from the profuseness of the flow. The omission, or error, consisted in not diagnosing the other pelvic complications. If they had been correctly diagnosed, the proper procedure would have been to first make a vaginal section and empty the suppurating ovarian cyst per vaginam; also the large tuboovarian abscess on the left side. As it was, the whole mass felt on examination was thought to be a myoma which had become adherent in the pelvis as the result of pelvic peritonitis.

Spinal analgesia was resorted to because of the heart complications, but it was not satisfactory, so that nitrous oxide and oxygen with a few drops of ether became necessary.

It was too early to report the termination, but the patient was doing well, despite the extensive peritoneal infection with pus.

SUBMUCOUS MYOMA. EXTREME RIGIDITY OF THE PELVIC FLOOR.  
SUPRAVAGINAL EXTIRPATION OF THE UTERUS.

The diagnosis of a submucous growth was verified on operation. The interesting feature consisted in the unusual rigidity of the pelvic floor, which, with the obesity of the patient, made it inadvisable to do a panhysterectomy, as had been intended.

CERVICAL MYOMA IN ANTERIOR WALL OF CERVIX. OVARIAN CYST  
WITH TWISTED PEDICLE.

A., forty-four years old, stated that she was taken ill one week before with an attack of severe pain which appeared without previous discomfort in her abdomen. The pain continued one hour and was followed by relief for two hours; then it began again and lasted three hours, followed by chills for an hour. More or less pain has been present since that time. Menstruation has been at regular intervals of four weeks, but very profuse.

An examination of the abdomen disclosed a cystic tumor, about 8 inches in diameter, which was not sensitive and could be moved by the palpating hands into different parts of the abdomen. In the lower abdomen a tumor was found which was readily diagnosed to be a myofibromatous uterus. The cystic tumor was diagnosed to be a cyst of the right ovary with a twisted pedicle but the twisting not

of such degree as to cut off the circulation entirely from the tumor because it was nonadherent and there was no evidence of peritonitis.

On operation, the diagnosis, so far as the ovarian tumor was concerned, was found to be correct. While there was a complete twist from right to left, yet it was not a tight twist. The myoma proved to be of the cervical variety, in the anterior wall of the cervix. The interesting feature, considering the location and size of the tumor is: there were no bladder symptoms, while usually, even very small tumors cause vesical irritation if in this location.

On the fifth day, coils of intestine were protruding, and when the bandage was taken off, it was found that there had been no attempt of union of the abdominal walls, but there was not the slightest evidence of infection. The wound was resutured, and an uneventful recovery followed.

#### DISCUSSION.

DR. GEORGE GRAY WARD, JR., had had two experiences in which there was a complete failure in the union of the abdominal wound and in the second of these it was what might have been expected because the patient was in an advanced stage of nephritis and her general condition was very poor. She had a carcinoma of the uterus and an operation was the choice of the family. The abdominal wound opened on the sixth or seventh day. It was immediately resutured and she made a complete recovery. She lived six months when she died of apoplexy.

DR. VINEBERG said that they all met with such cases and he recalled one case in particular. This patient had a very advanced and extensive carcinoma of the uterus and a radical operation was performed. At the end of two weeks there was no sign of healing of the abdominal wound.

#### VAGINAL SHORTENING OF THE UTEROSACRAL LIGAMENTS IN PRO- CIDENTIA UTERI, WITH A REPORT OF TEN CASES.

DR. HERMAN GRAD read this, the paper of the evening. He said that the various degrees of procidentia uteri had the same underlying factors. There was a failure of the action of the normal uterine support. In the parous woman the integrity of the ligaments became destroyed by traumatism, hernia, the loss of function, while in the nulliparous woman the uterine supports failed to functionate because the ligaments supporting the uterus and adnexa had not developed sufficiently to take up the proper function. In one case they had traumatism, while in the other they had a lack of development of the uterine supports as a cause of the uterine prolapse. Doubtless in many cases both causes were operative.

The female genital organs were maintained in the pelvis by virtue of their ligaments, the broad ligaments, the round ligaments, the uterosacral and the vesicouterine ligaments. Besides these there was another ligamentous structure, not a ligament but a fascia extending from the bony pelvic frame, bridging the pelvic cavity and which gave support to the contents of the pelvis. It gave

support to the bladder, the rectum, the female genital organs, the blood-vessels, lymphatics and the nerves. The fibers of this fascial structure mingled with the fibers of every muscle in the pelvic diaphragm, and so became a very strong fibrous structure of great functional activity and considerable elasticity and it was this fascial structure that held the uterus in its normal position in the pelvis. The afore-mentioned ligaments determined more the position of the organ, as well as contributing partially to the support of the uterus.

In every case of procidentia, whether partial or complete, this pelvic fascia had suffered a loss in its integrity, and this loss might have resulted from traumatism or lack of development. Traumatism of the pelvic fascia in labor was the great cause of procidentia, but prolapse of the uterus, however, depended on many other factors. One of the most important factors finally was intraabdominal pressure; once the uterine ligaments permitted a retro-displacement of the uterus, the intraabdominal pressure came into play and favored conditions which resulted in a prolapse.

A part of the fascia designated by anatomists as the vesico-uterine ligaments, in addition to that of giving support to the uterus, had the function of serving a shelf upon which the trigone of the bladder rested. A cystocele would result if this part of the pelvic fascia was destroyed. There were many cases where only this portion of the fascia became weakened or destroyed with the formation of a cystocele alone and here again, intraabdominal pressure came into play as a cause of the cystocele.

The perineum had nothing to do with the support of the uterus, but it had a tremendous effect on the ligaments that supported the uterus. The perineum was essentially a musculo-tendinous body capable of powerful muscular contraction and by its contraction it gave support to the ligaments that held the uterus in position. During any act that increased intraabdominal pressure the uterus and all the contents of the pelvis were forcibly pressed downward; during these moments the perineum was reflexly excited and responded to the stimulus by a powerful contraction, thereby aiding the uterine ligaments and preventing their overstretching. When the perineum had been destroyed by traumatism, the increased abdominal pressure had to be overcome by the ligaments alone; after some time these structures would give way and a prolapse of the uterus would result. Therefore, in every case of procidentia, the perineal body needed attention and when destroyed its restoration was an important step in the cure of the procidentia uteri.

The cervix played no inconspicuous rôle in prolapsus uteri; when lacerated the pelvic fascia suffered traumatism and loss of function; if deep, the pelvic fascia also suffered; if superficial the pelvic fascia might escape injury. It was essential in the surgical treatment of procidentia to restore the laceration of the cervix by union, or else to amputate the cervix entirely.

Having outlined his conception of the normal uterine supports and how they were affected in procidentia, Dr. Grad called attention



to the uterosacral ligaments; the operation of shortening these ligaments was described by Dr. Henry Jellett of Dublin and in his paper he said: "In general terms, the operation consists in exposing the uterosacral ligaments at their insertion into the uterus, in cutting them off the uterus, and in bringing them round in front and below the cervix, and at the same time, shortening them, as may be found necessary, so that they become again a support to that part of the uterus." Although this operation disturbed the normal anatomical relations because it brought the ligaments in front of the cervix, whereas normally they were behind, the operation accomplished just the condition they wished to bring about in prolapse of the uterus. The uterosacral ligaments were folds of tissue, capable of maintaining considerable pressure and weight and were one of the important ligaments that supported the female genital organs. They were a part of the so-called transversalis fascia which lined the abdomen and the pelvic cavity everywhere. If one pictured in one's mind the fascial sheet which extended from the bony structure of the pelvis and completely encircled the uterine cervix, it would be readily seen that if this fascial sheet having become overstretched or torn in parts was shortened by some operative procedure, it would of necessity raise these organs to which they were attached to a higher level, and that was exactly what was being done by the so-called shortening of the uterosacral ligaments.

The surgical treatment of prolapse of the uterus was divided into two classes: (1) Those operations having in view the formation of adhesions of the uterus to other parts in such a way as to hold the organs in the pelvis and prevent a prolapse of the vagina. (2) Those operations which shorten the uterine supports and in that way keep the organ from prolapsing. Again cases of procidentia might also be divided, so far as the surgical aspect was concerned, into two classes, viz., the cases that were past the menopause and those that were still in the menstrual period. In the latter class the operation of shortening the uterosacral ligaments was very applicable. In the former cases they readily yield to the so-called interposition operations. The operation of shortening the uterosacral ligaments by way of the vagina was not a difficult one and, as a rule, was readily performed. The ligaments were easily found and no difficulty was encountered in attaching them firmly to the cervix of the uterus. Dr. Grad was so well pleased with the results of the operation that he took pleasure in reporting his first ten cases that the members of the section might judge for themselves, the success with which the operation was attended.

Dr. Grad's conclusions were as follows: The Jellette operation of vaginal shortening of the uterosacral ligaments in procidentia uteri deserved a place among the carefully selected gynecological operations. It was based on a definite anatomical basis. The uterosacral ligaments were fascial sheets that were able to support the uterus and adnexa in the pelvis. The operation of vaginal shortening of the uterosacral ligaments was devoid of danger, could be easily performed, was practical in application, and brought

desired results. Vaginal shortening of the uterosacral ligaments was an operation that could be combined with other operations, such as shortening the round ligaments. It was an operation that his experience and his good results with it, permitted him to recommend it to all most highly.

#### DISCUSSION.

DR. S. W. BANDLER said: "Concerning Dr. Grad's paper, we of course are glad to hear of any procedure which serves to cure as annoying a condition as prolapse of the uterus. The doctor's use of the term 'pelvic fascia' is a little confusing. I think of the fascia as it covers the large muscles, such as the levator ani, or the vesicouterine fascia between the bladder and the vaginal wall. What Dr. Grad has called pelvic fascia we are accustomed to call pelvic connective tissue, full of elastic fibers, and generously distributed throughout the six connective-tissue ligaments which are attached at the level of the internal os, about the cervix. This tissue is especially abundant in the lower part of the broad ligament, constituting with the numerous muscle fibres at that point the "ligamentum cardinale" which I believe to be the most important structure in keeping the uterus in its normal position and holding it up in the pelvis. When a vaginal hysterectomy is done from below, and the peritoneal cavity is entered in front and behind, the uterus does not come down but remains in its normal position even if the whole upper part of the broad ligament of either side has been ligated off and cut and no impression is made on the position of the uterus until the ligamenta cardinalia are cut through.

"This pelvic connective tissue is very rich along the lateral borders of the cervix, and I believe that the uterosacral ligaments, which the doctor makes use of in the operation described, consist of or include much of this ligamentum cardinale. I do not wish to intrude the operation which I have described into this discussion, but I consider the high amputation of the cervix an important step of the operation, and the way in which I cover the new external os with vaginal mucosa includes within the needle's grasp these very structures, fastening them lateral to and anterior to the cervix. Any procedure such as the one mentioned by Dr. Grad, which serves to lift the cervix up and back into the hollow of the sacrum, is of great value because no operation can cure the patient unless the cervix assumes something of its natural location."

DR. SAMUEL JEROME DRUSKIN said that a similar operation was originated by Dr. Wagner of Vienna, and was first suggested in America by Watkins. At the Wertheim clinic the work was done by incising the anterior vaginal wall, then opening the peritoneum, getting a hold of the fundus and pulling it down and pushing the cervix back. This enables the operator to get at the sacrouterine ligaments of the prolapsed uterus with ease. The broad ligament is then button-holed on each side of and close to the uterus just

above the parametrium. The sacrouterine ligaments are now cut close to their uterine attachment and drawn through the openings in the broad ligament, crossed on each other and fastened in front of the cervix. Redundant ligament is resected. The lower portion of the uterus now rests in a sort of a hammock. The results in this clinic were very good. He laid stress upon preserving the cervix.

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## TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

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*Meeting of April 27, 1913.*

*The President, BROOKS H. WELLS, M. D., in the Chair.*

DR. SAMUEL STERN read a paper on the

X-RAY TREATMENT OF UTERINE FIBROIDS, MENORRHAGIA AND  
METRORRHAGIA.\*

### DISCUSSION.

DR. BRETTAUER was very much interested in the results reported by Dr. Stern in the treatment of uterine fibroids with the x-ray. These results were only considered temporary and as such were extremely satisfactory.

Röntgenology has developed into a science which admits of a distinct differentiation between all the constituents of the rays, and which makes it possible to prevent the occurrence of the burns which were formerly so frequent. Its application, therefore, is without danger and I believe that it should be included in the methods used for the relief of patients suffering from uterine fibroids, which bleed too profusely.

As is the case with all new remedies, the x-ray will naturally be used indiscriminately by many, and against this, I want to sound a serious warning. It should never be employed when the adnexa are diseased, or when there is the slightest suspicion of malignancy.

In women who bleed irregularly about the time of the climacteric, a curetage, followed by a microscopical examination of the scrapings, should precede any application of the x-ray.

In the presence of submucous fibroids, the x-ray is apparently of no avail. One such case was operated upon later. Microscopical examination of one ovary which was removed showed a most interesting condition. As a rule, ovaries removed with fibroid uteri show a greatly increased number of follicles in all stages of development, while in this instance, although a number of sections

\*For original article see page 1133.

had been examined, only one solitary follicle in the stage of development was found. There was no decrease in the number of primordial follicles found.

DR. ROBERT TILDEN FRANK believed that the reader of the paper very properly took a most conservative stand in contradistinction to certain German authors who reported one thousand cases and claimed that after the employment of the x-ray in these cases the uterine fibroids, menorrhagia and metrorrhagia not a single failure had to be recorded. None of them seemed inclined to make or support such an extreme statement.

As in many other discoveries made in the domain of medicine this method had been accidentally discovered. Dr. Brown and Dr. Osgood reported the fact that male x-ray workers became sterile. Other investigators, by experiment, determined the effect of the x-ray upon the ovary and after a similar influence was determined in the female, began to elaborate a therapeutic application.

Dr. Frank said he had examined but one case microscopically and Dr. Robert Meyer had examined six cases of fibroids and ovaries treated with the x-ray. He agreed with the findings of other investigators that the follicular apparatus, especially the Graafian follicles, were destroyed. The primordial follicles were least affected. There was also a certain effect upon the fibroid itself in these cases. This showed itself in the marked and peculiar hyaline degeneration of the stroma, although the muscle cells seemed to be little affected.

So-called x-ray castration in young people was rather evanescent. With regard to the possible effect upon future pregnancies, this remained to be determined. The x-ray caused a cellular hyperactivity when the treatment was begun and therefore might produce increased bleeding for the first few treatments.

In many cases where operation was contraindicated the x-ray proved a valuable addition to their armamentarium and this applied especially to patients with very severe heart, kidney, or other organic lesions. Again, in some patients who refused operation through fear of the knife, the x-ray helped one out of an embarrassing dilemma. In many cases of menorrhagia or metrorrhagia where curetage had failed and where something else was advisable besides hysterectomy on account of the patient's youth, the x-ray often worked beautifully.

With regard to the contraindications, cases of diseased adnexa with repeated attacks of pelvic peritonitis, ovarian tumors, etc., should not be x-rayed. Then, too, malignancy was quite common in connection with uterine fibroids and hence it was very important that the gynecologist examine very thoroughly every case especially in menorrhagia and metrorrhagia, that he curet and submit the scrapings to microscopical examination. This applied especially to women around the forties in whom carcinoma of the corpus occurred so commonly.

With the present technic there were no dangers to be apprehended from x-ray burns. The possibility of the occurrence of carcinoma

or of sarcoma should be kept in mind in all instances of uterine tumor. Injuries to adjacent organs could not play a very important rôle, although in one case reported adhesions were found around a previously x-rayed fibroid, but this could not be definitely ascribed to the employment of the x-ray. The x-ray could never supplant operation in cases where the fibroid caused pressure symptoms. Nor could it be employed when the fibroids were of rapid growth, because there might be present some malignant change, one that called for more radical interference. The chief value of the treatment lay in its hemostatic action which in selected cases served to tide over a number of years or to produce complete cessation of the bleeding.

DR. FLORIAN KRUG regretted that he could not share the roseate colored view of those who spoke in regard to the merits of the x-ray "cure" of uterine fibroids. Many years ago he stood almost alone and called out a warning against the then prevailing, unbalanced enthusiasm for the much heralded claims of the Apostoli treatment of fibroid tumors. It was then claimed that the largest kind of fibroids would disappear under the magic melting power of the constant electric current, just like every human ailment would disappear from a long sufferer under absent treatment, according to the claims of Christian science healers.

The busy abdominal surgeons had long records of hysterectomies that had to be performed in cases which had become aggravated and were rendered technically most difficult by the vain attempts at fibroid electrocution. Was there, so Dr. Krug asked, in this audience one of the former rampant advocates of the Apostoli treatment who would have the courage to stand up and repeat the preposterous extravagant claims that were made for it in former years. He predicted that the x-ray treatment of uterine fibroids was doomed to go down in history in the same way. Carefully compiled modern statistics showed a much higher percentage of malignant degeneration in fibroid tumors than had been believed in former years. Since the advanced methods of pathological examinations had become en vogue, malignancy was often found in the removed specimen when no positive clinical sign existed before the operation, and where the operator merely suspected it. In many such instances the surgeons had been congratulating themselves that they had been able to save the life of the patient who readily and confidently accepted their advice to have a hysterectomy for fibroids performed and where the pathologists afterward found an isolated focus of incipient malignancy. What was to become of those cases if valuable time was lost by dilly dallying with x-ray treatment? Should it become as fashionable in America as it had already in some parts of Europe for women to absolutely refuse rational surgical relief, which was strictly indicated, and to prefer the most horrible x-ray burns to a cleanly cut abdominal incision. Of course, one was told that these burns would now be obviated by not using strong dosage and by drawing out the treatment over a prolonged period. From a financial point of view this was certainly in favor of the x-ray specialist, who

had learned to protect himself against the injuries of the Röntgen rays. Still, a great many men had injured their health irretrievably by monkeying with this buzz saw of a powerful agent, which was not yet quite as well understood even by the most experienced in all its possibilities and sequelæ as they would make others believe. A number of cases of malignant disease were known to have developed on the hands and arms of medical men who were devoted to x-ray science before they had learned to better protect themselves against the exposure.

As before mentioned, it was proven beyond peradventure, by careful statistics, that a much higher percentage of uterine fibroids had the tendency to develop malignant degeneration than surgeons were formerly inclined to believe. But how about the obvious danger that a prolonged x-ray treatment might *of itself* produce malignancy in these otherwise benign neoplasms? The advocates of this new panacea claimed that the main benefit of the x-ray "cure" was to be attributed to the fact that it stopped the function of the Graafian follicles. Many years ago, when they had not yet mastered the technic of removing a diseased uterus even under the most difficult conditions, Battey and Hegar advised the removal of the ovaries as a substitute. Today all surgeons were perfectly aware of the fact that this was an unsatisfactory procedure. Fibroids would continue to bleed, to grow, to cause pressure and pains, to form adhesions and produce peritonic attacks after every bit of ovarian tissue had been removed.

So at best, this latest fad could not be claimed as an improvement on an old discarded method. Still, Dr. Krug said he would like to ask another much more serious question: If the Röntgen rays were powerful enough to destroy the function of the ovaries, and thus perform a bloodless Battey-Hegar castration, what guarantee could the advocates of this treatment give that it did not also destroy the functions of other important pelvic, abdominal and retroperitoneal organs which were naturally exposed to the same powerful action. Would the kidneys, the suprarenals, the delicate physiological arrangement of the digestive tract with its glands and ganglia, etc., be immune from its influence?

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## TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

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*Meeting of October 11, 1912.*

*The President, WILLIAM MERCER SPRIGG, M. D., in the Chair.*

The President delivered his annual address on the

### TREATMENT OF EARLY ECTOPIC GESTATION.

DR. SPRIGG expressed to the members of the Society his sincere appreciation of the honor done him in electing him again to the presi-



dency and called attention to the individual duty of each one to make the meetings full of scientific interest.

He then discussed the treatment of the early cases of ectopic pregnancy under three heads:

*First. Prior to Tubal Rupture.*—Here the treatment is by operation as soon as the diagnosis can be made.

*Second. At the Time of Rupture.*—In spite of much discussion pro and con it must be admitted that these cases are not safe until after operation; therefore, if the patient is seen at the time of rupture, operate as soon as she can be prepared. If she is in extreme condition when first seen and, after careful observation and the administration of salt solution, is losing ground, operate at once. If improving it may be well to wait until she has recovered from shock.

Operate rapidly and with as little disturbance of the abdominal viscera as possible. Have a clear conception of what is taking place in the abdomen, and a clear picture of the uterine blood supply. Clamp and remove the tube. Remove the large blood clots from the abdominal cavity; flush out the smaller with warm salt solution; do not be too particular, the clots are sterile and will be taken care of by the peritoneum.

The normal tube on the opposite side should not be removed; when diseased remove it if the patient's condition will allow.

At the time of tubal abortion the ovum does not always escape into the peritoneal cavity, sometimes the rupture occurs through the floor of the tube, the escape being downward through the folds of the broad ligament. This variety of rupture is not attended with the same amount of hemorrhage or shock. In this instance the uterus is pushed upward and to the opposite side of the pelvis by the hematoma. If the diagnosis is clear there is no haste for immediate operation, yet much delay is not advisable because of the risk of secondary rupture through the folds of the broad ligament or of infection from the bowel.

*Third. Treatment Sometime after Rupture.*—It not infrequently happens that unrecognized rupture of a tubal gestation takes place and the case does not come under observation for weeks or months after. There is no doubt there are many cases of tubal rupture in which the tube empties itself completely and the patient recovers without operation, yet it is not wise to make this prognosis.

If the escape of the ovum has been intraperitoneal and upon examination a boggy hematocele is recognized, operate, remove the clots and tube.

If the hematocele is infected, operate by vaginal incision and drainage, otherwise by the abdominal route.

If the case is seen a considerable time after the tubal rupture and there have been no recurrent hemorrhages, and the hematoma is small and getting progressively less, it may be wise to advise noninterference.

*Meeting of November 8, 1912.*

*The President WILLIAM MERCER SPRIGG, M. D., in the Chair.*

DR. G. D. GRASTY read the essay of the evening on

INFLUENZAL MENINGITIS IN A CHILD, WITH REPORT OF A CASE.\*

DISCUSSION.

DR. WILKINSON opened the discussion considering the factors determining the infection on the meninges and brain. Usually the meningitis was secondary to an infection elsewhere in the body. In one child with influenzal lung symptoms, the child received a blow on the head with the formation of a hematoma and skull fracture which became infected and the starting-point of the influenzal meningitis. In poliomyelitis there was a nasal infection that rarely spread to the meninges giving the symptoms by which the disease was commonly recognized. Wilkinson had had five pure influenzal meningitis cases and two cases with mixed intracellularis infection. Eleven per cent. of the pure influenzal cases recovered. The serum treatment had been worked up on animals but no human cases had as yet been reported.

DR. DONNALLY said that 1 or 2 per cent. of all meningitis cases were of gripe origin. The meningococcus was the only organism that was found solely in the nervous system. All the other meningitis cases were secondary infections through the blood.

DR. CARR said that the determining factor of the meningeal infection was not clear. The cases occurred most often in children with actively growing brains. The meningeal infection pointed out one more serious gripe complication and the necessity of curing the gripe before the complications set in. Many cases could be improved by the care of the nose and throat and the use of salicylates.

DR. FREMONT SMITH noted the lauded efficiency of urotropin in the mucous membranes of the throat and spoke of it with the salicylates as a possible preventive treatment for the complications of gripe.

*Meeting of December 13, 1912.*

*The President, WILLIAM MERCER SPRIGG, M. D., in the Chair.*

DR. SPRIGG presented a specimen of

INCOMPLETE TUBAL ABORTION OPERATED UPON SIX MONTHS AFTER RUPTURE.

Mrs. X, age thirty-six, last normal menstrual period January 29, 1912, lasting four days. Known date of intercourse February 11, 1912. March 1, had scanty menstrual flow lasting for ten days,

\* For original article see page 1031.

shreddy in character, with the general feeling of great discomfort, with pressure in the pelvis, during the entire month. March 29, had severe pain in the pelvis on the left side, beginning at 1 P. M., lasting until 5.30. The paroxysms of pain intermittent in character, the intermissions lasting as long as ten minutes. For the following thirty-six hours patient was quite exhausted, scarcely moving in bed. Her physician made a vaginal examination at this time and stated that the uterus was enlarged. The second attack of pain occurred April 8, eleven days after the first pain and lasted for one hour—was not as severe as the first attack, nor was there much exhaustion. Her physician thinking that her pain was due to a gravid uterus inserted a pessary, which immediately caused another severe attack of pain with some exhaustion, and it was immediately removed. There was no bloody discharge with this second attack of pain. April 11, there was a free flow of shreddy blood and small clots, lasting for five days. April 27, another attack of bleeding of the same character lasting for five days. On May 25 she had a normal menstrual flow and has menstruated normally every twenty-eight days since this time.

The patient was first seen by me September 18, 1912. At this time a vaginal examination was made and a small mass about the size of a lemon was readily made out to the left of the uterus, not attached to it, and seemed to be the tube. Patient was advised as to the nature of the mass and early operation suggested. She was operated on September 28, and the specimen as exhibited removed. The patient made an uneventful recovery.

#### DISCUSSION.

DR. I. S. STONE in discussing the case called attention to the fact that in such a late case there would probably be none of the blood found in the peritoneum that is usually characteristic of the early ectopic pregnancies, after rupture.

DR. MILLER said that in this case the life of the fetus must have been destroyed at a very early stage.

DR. SPRIGG in closing said that the history had been distinct enough of tubal abortion with pain and shock, to make a diagnosis. The point of rupture of the tube was below and to the uterine side of the ovum. The microscopic examination confirmed the diagnosis of pregnancy. The cases of complete rupture and death of the fetus were more common than the incomplete rupture which left a hematoma to be found after six months. This case argued for the delayed operation urged by Hunter Robb.

DR. I. S. STONE reported a case of

#### PUERPERAL INFECTION WHICH WAS RELIEVED BY ONE INJECTION OF A STOCK STREPTOCOCCIC VACCINE.

Mrs. H., white, age thirty-six, a patient of Dr. ———, in this city, was delivered of her third child on Oct. 8, last. One digital examination was made previous to delivery, and the labor was completed without further manual interference. Rubber gloves were not used. The physician had not had an infection in many years of obstetrical

experience. The patient had a rise of temperature on the second day, which reached  $102+$  on the fourth day. Slight rigors, but no severe chill occurred at any time. At the time of the consultation on the 14th, six days after delivery, the temperature had reached  $105$ . The patient had a dry pleuritis on the left side. No pain or tenderness in the abdomen. Cultures made from the uterine cavity showed one with pure streptococci and another with both streptococci and staphylococcus aureus. Without waiting for the autogenous vaccine, we decided to accept Dr. Russell's offer of a very fine article of streptococcic stock serum which he recently prepared. Fifty cubic centimeters of this was injected on the 15th, about eight days after the birth of the child. During the morning of that day the temperature was  $103.5$ , pulse 145, respirations 45. The patient had a sharp reaction some hours after the administration of the serum. Headache and general malaise with rise of temperature to  $105.5$ .

The next day all of the symptoms began to subside. The pulse and temperature dropped to 120 and  $102$  respectively, and the respirations to 30. The condition of the patient now gradually but continuously improved. On one occasion only since the serum was given has the evening temperature reached  $101$ . Pain in the chest began with the earliest symptoms. The most careful examination failed to find any fluid in the pleural cavity either during or since the attack. We believe the pleuritic attack due to embolic infection.

#### DISCUSSION.

DR. MILLER agreed that the best method of treatment of the streptococcus infection was by the vaccine, and cited several cases of his own that had done well with the vaccine. The stock vaccine was efficient at times. In one streptococcus case he had seen involvement of both parotid glands.

DR. STONE said the case he reported was one in which the diagnosis had been made on the fever chart and the cultures from the uterus. There had been no local pelvic symptoms of pain, tenderness, induration or infiltration of broad ligaments and no local treatment had been given.

DR. MORAN said that the diagnosis was probably a streptococcus endometritis which would account for the absence of local pelvic symptoms.

DR. WHITE asked how the cultures had been taken from the uterus and called attention to the technic of culture taking which required the intrauterine glass speculum to be introduced first and then the wire for the culture introduced through the tube speculum.

DR. CHAS. S. WHITE presented a case of

#### RUPTURED TUBAL PREGNANCY.

Mrs. X., the mother of six children, had normal menstrual periods for many months until October, at which time the monthly flow did not appear. Her physician saw her in November, at which time a moderate flow was established, induced, as she thought, by the use of drugs she had freely availed herself of. In December the

menstruation did not make its appearance. Dr. W. G. Thomas was called to see her at this time and found her in collapse. From the family he learned that she had taken large doses of quinine. The critical condition of Mrs. X. induced her physician to send her to a hospital at once, where she died in about one hour, in spite of stimulants and salt solution subcutaneously.

Postmortem, the abdominal cavity was seen to contain two quarts of liquid and partly coagulated blood, the source of which was the right tube. The tube had ruptured, but the amniotic sac was intact, with the fetus within. The slight tear in the tube, the unruptured sac and the very small fetus were conditions unusual and not frequently found in connection with the enormous hemorrhage. The fetus measured about 1.5 centimeters in length.

The case emphasizes, if such emphasis is necessary, the necessity for an early diagnosis and operation. It clearly demonstrates that extrauterine pregnancy may be interrupted by a fatal hemorrhage at any stage and there can be no period of such gestation that is free from a grave danger. Just what part quinine played, whether it stimulated contraction and rupture of the tube, remains undetermined.

#### DISCUSSION.

DR. SPRIGG commented on the beauty of the specimen presented by Dr. White and said that the case showed the opposite side of treatment of extrauterine pregnancy from what his own case had shown and emphasized the importance of early operation in such conditions.

DR. MILLER called attention to the difference in treatment of the two cases of ectopic pregnancy and noted that if Dr. White's case had been kept absolutely quiet she might not have died. Dr. Hunter Robb would have said that moving the woman to the hospital had caused her death. Dr. Miller thought that much was to be said in favor of postponing the operation because many of the cases he had operated on showed the old blood clots of past hemorrhages.

DR. STONE thought that immediate operation was indicated in nearly all cases. He had had only one death after operation.

DR. ROY asked what diagnosis had been made at the hospital.

DR. WHITE said that the hospital had scarcely had an opportunity to make a diagnosis as the woman had died within an hour of admission. The case had been admitted with a history of taking poison.

DR. WILSON read the essay of the evening on the

#### MAMMARY THEORY OF THE ORIGIN OF ECLAMPSIA.\*

#### DISCUSSION.

DR. MORAN said that while eclampsia and the parturient paresis of cattle were both toxemias associated with pregnancy, that the analogy was superficial and the conditions not by any means proved

\* For original article see page 1111.

to be the same. There were several marked points of difference. Eclampsia occurred most frequently in primiparæ. Parturient paresis occurred in primiparæ only six times in a thousand cases. Eclampsia occurred in any kind of residence from shanty to palace. Parturient paresis occurred only in the cases of bad housing. Eclampsia occurred independent of diet. Parturient paresis with special diet. Eclampsia was not contagious, while parturient paresis was contagious as shown by the repeated cases occurring in the same stable. Eclampsia was regularly characterized by convulsions and parturient paresis never showed convulsions. The analogies in the tissue changes of the two conditions were common to the pathology of many toxemias so that the identity of the two conditions still remained to be proven. The treatment of parturient paresis by distention of the lacteals which has changed the mortality from 70 per cent. to 1 per cent. was most interesting and unusual. The rationale of the action had not yet been made clear. But even that remarkable transformation in the mortality of parturient paresis did not seem to warrant the double mammary amputation proposed for eclampsia.

DR. JOHN LEWIS spoke of the frequency of milk fever in cows. He had had a case in a cow of his own two weeks ago. She was in a markedly relaxed condition and apparently almost dead. Her udders were then distended with air and in a few hours she seemed perfectly well and in twenty-four hours was giving milk. Over-feeding with grain before labor was held to be the cause of this parturient paresis.

DR. STONE called attention to one herd of high-grade cows living in stables with good ventilation and on low feeding under one manager in which there had been no deaths for many years from parturient paresis. Under a new manager who gave more liberal feeding and consequent greater supply of milk the same herd had twelve deaths in one year.

DR. NICHOLS noted that the common pathological features of the toxemias suggested a common cause and the difference in symptoms might be accounted for by the difference in the species.

DR. MORGAN noted that the necrotic liver foci common to the two conditions under discussion were also common to the toxemias of chloroform, ether, nitrous oxide, phosphorous, mushrooms, yellow fever and acute yellow atrophy.

DR. WILSON in closing said that he believed the two conditions dissimilar but that the investigation of the analogies seemed desirable.



## ITEM.

## CLINICS, DEPARTMENT OF PUBLIC CHARITIES.

*Calendar for June, 1913.*

N. Y. Children's Hospitals and Schools (Randall Island).—Orthopedics, Dr. Ogiloy, Tuesdays, 10:00 A. M.

Cumberland Street Hospital (Brooklyn).—Gynecology, Dr. Burnham, Tuesdays, 1:00 P. M.

Kings County Hospital (Brooklyn).—Obstetrics, Dr. Commiskey, Tuesdays, 10:00 A. M.

City Hospital.—Obstetrics, Dr. Shears, Wednesdays, 2:00 P. M.

Kings County Hospital (Brooklyn).—Orthopedics, Dr. Truslow, Wednesdays, 9:00 A. M.; Orthopedics, Dr. Napier, Wednesdays, 2:00 P. M.

Coney Island Hospital.—Pediatrics, Drs. Beck and McQuillan, Wednesdays, 3:30 P. M.; Pediatrics, Drs. Pendleton and Van Wart, Wednesdays, 3:30 P. M.

City Hospital.—Gynecology, Dr. Stearns, Thursdays, 2:00 P. M.

Cumberland Street Hospital (Brooklyn).—Gynecology, Dr. Burnham, Thursdays, 1:00 P. M.

Kings County Hospital (Brooklyn).—Obstetrics, Drs. Commiskey and Judd, Thursdays, 10:00 A. M.

Coney Island Hospital.—Gynecology, Drs. McEvitt and Mills, Thursdays, 10:30 A. M.; Gynecology, Drs. Mayne and Ranken, Thursdays, 10:30 A. M.

Kings County Hospital (Brooklyn).—Gynecology, Dr. McNaughton, Fridays, 9:00 A. M.

Kings County Hospital (Brooklyn).—Obstetrics, Dr. Commiskey, Saturdays, 10 A. M.

*All registered physicians, resident and visiting, and medical students, are cordially invited to attend these Clinics.* Cards of admission, valid until October 1, 1913, may be obtained at the Academy of Medicine, 17 West 43d St., Manhattan, and at the Medical Society of the County of Kings, 1313 Bedford Ave., Brooklyn.

## BRIEF OF CURRENT LITERATURE.

## OBSTETRICS.

**Duplication of Genitals with Labor at Term.**—J. E. Gemmell and A. M. Paterson (*Jour. Obst. Gyn. Brit. Emp.*, 1913, xxiii, 25) describe a unique case with a single anus and rectum; duplication of vulva, urinary and genital ducts, bladder and uterus; wide separation of the pubic bones; and absence of a true umbilicus. The writer observed a pregnancy and labor in each uterus.

**Ovarian Pregnancy.**—In a case diagnosed as extrauterine pregnancy, C. Oldfield (*Jour. Obst. Gyn. Brit. Emp.*, 1913, xxiii, 41) found a mole lying among blood clots and a left ovary, little larger than the usual size, and presenting a saucer-shaped raw surface from which blood oozed at the time of the operation. Sections of the ovary showed at the position of the raw surface, innumerable enlarged blood-vessels, some extravasated blood and a layer exactly like the blood sinus in an early uterine pregnancy. One villus was seen *in situ* and Nitabuch's membrane (layer of fibrin separating fetal from maternal structures) could be defined nearly the whole way across the surface above mentioned. An oval, compact mass of lutein cells occupied one end of this saucer-shaped depression. There is therefore no doubt that it was on this surface that the ovum was implanted.

**Eclampsia and Puerperal Paresis.**—Pierrson (*Arch. f. Gynäk.*, vol. xcvi, 2) in view of the similarity between eclampsia in the human subject and general paresis in cattle, presents a further contribution to this important subject, based on studies in cows and goats. His conclusions, which are stated with certain reservations, are as follows: eclampsia and paresis are two diseases which have so much in common that it may be assumed that the same etiological factors underlie both. He believes that this consists of an overabundance of fetal nourishment in the blood of the maternal organism. In cattle this results after delivery where a previously free secretion of milk becomes inhibited; in women during pregnancy, either because of a disproportion between the amount of fetal nutrition present and the ability of the fetus to take up the same, or at the time of labor by an insufficient function of the mammary glands. If the theory proposed by Rauber that the leukocytes are bearers of the fetal nutrition, is correct, then the hyperleukocytosis in the nephritis of pregnancy and eclampsia may be regarded as an evidence of the retention in the blood of this excess. The veterinary treatment of puerperal paresis has been directed to mechanical procedures. The attempt to inject oxygen or potassium iodide solution subcutaneously in eclampsia is not supported by the veterinary treatment of puerperal paresis. If headache, restlessness, and a high-tension pulse may be regarded as prodromal symptoms of eclampsia during the puerperium, then repeated expressions of the milk from the mammary glands must act as a prophylactic measure against the disease. Repeated emptying of the glands in the puerperium is therefore indicated. If the symptoms referred to are present in the nephritis of pregnancy they will certainly disappear after injections of potassium iodide, and this drug may therefore be regarded as a prophylactic against eclampsia. The author claims that the potassium iodide treatment ought to be from the outside. The therapeutic activity is believed by Pierrson to be due to the fact that this salt reduces the viscosity of the blood. As sodium chloride increases the latter condition, the employment of this salt in eclampsia is contraindicated.

**The Antitrypsin Content of the Blood in Pregnancy and with Carcinoma.**—Graff and Zubrzycki of Wertheim's Clinic (*Zeitsch. f. Geburts.*, vol. lxxii, H. 2) state that the antitrypsin content of the serum in carcinomata is quite regularly increased to such an extent that its presence affords a certain method of diagnosing the presence of this condition. After a radical operation these high values disappear only to reappear with recurrences, which must be regarded as a particular advantage in the reaction. The practical application of the method is interfered with to some extent by the fact that almost all cachectic individuals will give rise to the reaction under certain circumstances. As regards the value of this reaction in the early diagnosis of pregnancy, the authors are unable to assume any definite action for the same, although undoubtedly an increase in the antitryptic index occurs, but during the later months a well-marked increase in this content is present in contrast to what is found in the earlier months.

**The Etiology of Melena Neonatorum.**—Wolff (*Zeitsch. f. Geburts.*, vol. lxxii, H. 2) in view of the claim that this condition is produced by a retrograde embolism, has made a series of animal experiments, as the result of which he claims that melena may be experimentally induced by the injection of the umbilical vein of young dogs. The demonstration of a thrombosis in the umbilical vein and of circumscribed circulatory disturbances including necrosis and thrombosis, have been shown in the autopsy of a new-born infant as the basis for ulceration and hemorrhage in the duodenum. It was further shown that the retrogressive embolism may follow a path from the umbilical vein into the wall of the stomach and intestine. Wolff also describes a case of volvulus which appeared during the first days of infant life, accompanied by the signs of a melena.

**Acetonuria in Extrauterine Pregnancy.**—Novak and Porges (*Berl. klin. Wochenscr.*, Nov. 25, 1912) in a previous communication showed that acetonuria which is frequently observed in pregnancy is the result of a metabolic disturbance due to a peculiar predisposition of the patient, which in the large majority of cases may be brought about by a brief withdrawal of carbohydrates and which disappears rapidly after the puerperium. It was also stated that the cause of this disturbance resides in a relative hepatic insufficiency. The same authors have since then extended a similar research in cases of supposed extrauterine pregnancy, as a result of which they claim that a positive result in suspected cases of extrauterine pregnancy favors the existence of the latter, although this cannot be accepted as an absolute test.

**Sugar Metabolism in Pregnancy and Puerperium.**—Bergsma (*Ztschr. f. Geb. u. Gyn.*, Bd. lxxii, No. 1) presents an extended study of this subject based on observations made in Veit's clinic, as a result of which he believes that during these periods no normal insufficiency of the liver exists, and that this organ does not present any evidences of decreased functional activity. For this reason he denied the existence of the so-called liver of pregnancy. It is only in isolated cases that the liver is more or less insufficient, and that

this becomes restored in most cases soon after labor. The condition of alimentary glucosuria which readily appears during pregnancy cannot therefore be regarded as an evidence of hepatic insufficiency, but on the contrary this probably results from a physiologically increased function of the renal epithelium during pregnancy. During labor a physiological hyperglycosuria appears from which a return to the normal depends on the length of the labor, the muscular exertion of the uterus, and the more or less marked general exhaustion which attends the same. During pregnancy the sugar content of the blood varies between normal boundaries while in the puerperium a return to the normal high point results. In a few cases of eclampsia and pregnancy nephritis which were examined, a well-marked disturbance of the sugar metabolism did not become evident, which seems to contradict any marked functional hepatic disturbance at this time.

**The Infection of the Child during Labor by Vaginal Organisms.**—Noack (*Ztschr. f. Geburts. u. Gynäk.*, vol. lxxii, H. 3) presents an interesting research conducted in Veit's clinic with reference to the production of a variety of infections of the new-born by this means, from which it appears that in the vaginal organisms of the mother exists a serious source of infection for the child both on account of their increased virulence and as a result of extended opportunities for their transmission. The author claims that this is even of greater frequency and consequence than occurs through the agency of external sources of infection. It is probable that infection of the mouth, breasts, and the umbilicus are not due to uncleanly procedures after labor but are produced intrapartum. Regarding the possibility of prophylactic measures in such conditions, the author believes that if vaginal infections are present before labor these should be cared for before the event especially if of a gonorrheal or other acute character.

**Intestinal Obstruction after Labor.**—Rieck (*Zentralbl. f. Gynäk.*, Jan. 4, 1912) directs attention to paralysis of the bowel which is likely to result from compression of the rectum particularly in cases of a flat rachitic pelvis. In view of this possibility it is desirable to obtain a complete emptying of the intestines before delivery as before operations. Another measure of value is keeping the patient on the side or in the knee-chest position in cases where a contracted pelvis is present. In cases where it is impossible to obtain a bowel movement, a rectal tube should be introduced with the finger through the anus past the promontory. Frequent emptying of the bladder is also of value in providing more room at the pelvic inlet.

**Ileus during Pregnancy and the Puerperium.**—Van der Hoeven (*Zentralbl. f. Gynäk.*, 1912, No. 46) in an analysis of seventy cases of ileus found a mortality of 46 per cent. in the operative cases and 81 per cent. in the nonoperative ones. In fifteen of this series the cause of the ileus could not be determined at autopsy. As the number of cases of ileus in which the cause is unknown are much less frequent where pregnancy is not present, the etiological factor in those cases

observed during pregnancy must reside in this condition. It is unlikely that the gravid uterus exerts any undue pressure on the intestines except perhaps in hydramnios. It is possible, however, that the uterus exerts its pressure on the intestines at the pelvic inlet. If the uterus does not rise out of the true pelvic at the end of the fourth month, and the vagina does not become sufficiently stretched to permit of this change in position, then the cervix will be pulled downward in the pelvis. The author believes, as a result of his observations during a laparotomy in the third month of pregnancy, that this is the only etiological factor in the production of an ileus at this time. The uterus which is still large is likewise displaced downward in a similar manner which is especially noteworthy where the organ is fairly large and the pelvis small. In one of the author's cases operated upon two days after Cesarean section, the ileus was undoubtedly due to this displacement. An artificial anus favored the emptying of the intestines until the uterus had become so small that the contents were again able to pass into the rectum. The author believes that the displacement of the uterus referred to is also the cause of the lesser degrees of intestinal obstruction observed during pregnancy.

**Eclampsia and Anaphylaxis.**—Liepmann (*Gyn. Rundsch.*, vol. vii, H. 2) discusses the claim which has recently been made by Wolf-Eissner and others regarding the association between these two conditions, and from a contrast between the typical symptoms of these two disturbances believes that experience and observation has shown that eclampsia and anaphylaxis pursued two different paths which are parallel but never cross and are never uniform. This seems to be confirmed by clinical and experimental observations which show that eclampsia is a toxemia of which the source, according to Liepmann, is the placenta. For this reason he believes that the only efficient treatment of eclampsia is by methods of rapid delivery. Regarding the statement which has been made that eclampsia occurs in normal individuals who are nervous, oversensitive, and overeducated, he believes that experience has shown that on the contrary the disease is much more apt to occur in robust, insensitive, and dull women from the lower classes. Fever, which is the principal symptom of anaphylaxis, is comparatively unimportant in eclampsia. One of the most important questions in regard to the absence of anaphylactic conditions in eclampsia is in reference to the repetition of the disturbance in the individual or its more frequent presence in primipara or multipara. The adherents of the anaphylaxis theory of eclampsia base their contention on the material absorption of foreign albuminoids, in this case placental villi. There is no doubt that placental elements find their way into the maternal organization, but this circumstance can be regarded as a physiological fact only, because such substances are essentially material in origin, and cannot, therefore, be regarded as foreign albuminoid bodies. Moreover each new pregnancy would bring about an increase in sensitiveness to this substance, whereas, it is a well-known fact that disturbances of pregnancy of this

character are much more frequent in the first than in subsequent pregnancies, moreover the recurrence of an eclamptic seizure is rarely repeated in subsequent pregnancies, and is much less frequent than the recurrence of measles, scarlet fever, or other infectious diseases. It seems probably, therefore, that as a rule recovery from eclampsia brings about a certain degree of immunity which is distinctly opposed to the biological condition known as anaphylaxis.

**Histology of the Hypophysis during Pregnancy.**—Alfred Siguret (*Thèse de Paris*, 1912) has made a complete study of the histology of the hypophysis during pregnancy in rabbits and guinea-pigs. He states that during pregnancy the glandular lobe of the organ is the seat of histological modifications. The most marked are these: enlargement of the cellular cords, general hypertrophy of the nuclear cells, diminution of the number of chromophobe cells, and increase of the siderophile cells. No colloid substances were found, perhaps because young, healthy animals were used for examination. The author believes that the demonstration of these substances has been due to faults of technique. These modifications commence at the beginning of gestation and do not seem to increase progressively during gestation.

**Treatment by Salvarsan of Syphilitic Women During Gestation.**—Jeanselme (*Ann. de gyn. et d'obstet.*, Jan., 1913) has used injections of salvarsan in eighteen cases of pregnancy complicated with syphilis. He was careful to examine the urine previously for albumin, to divide the doses, and to increase their number in such a way as to lessen intolerance to the drug. Each patient received a series of five or six injections separated by about seven or eight days. If treatment is begun in early pregnancy it is possible to give two series of injections about two months apart. The author had sixteen pregnant women who showed unmistakable syphilitic lesions, and two who had had them at an earlier date and had resulting abortions. In the last two the drug was given with a view to allowing pregnancy to go to term and produce a living child. The doses given were 1.80 grams to 2.40 grams in six intravenous injections. In pregnant women the phenomena of reaction such as nausea, vomiting and diarrhea are not severe. In a few injections uterine colic was produced, with increased fetal activity. No abortions were produced and the destructive action of syphilis on the fetus was prevented. Only two women had macerated fetuses. The puerperal days were absolutely normal. Out of the fourteen living children four died later, but none of them of syphilis, all of intercurrent diseases. Not one of the living children showed any evidences of syphilis at birth. The weight of all the children was normal showing them to be vigorous. It is seen that the Wassermann reaction is not necessarily alike in mother and child at birth. The syphilis may be in a latent state and not entirely cured, but reappear afterward. The two women who had previously aborted through their syphilitic infection both bore living children. Contrasted with these results of treatment with salvarsan, the statistics of Pinard, Champetier de Ribes, and Potocki concerning women who had been



treated by mercury show that out of 163 cases there were 25 per cent. of children living and normal, 14.72 per cent. manifestly syphilitic, and 19 per cent. macerated.

**Use of Salvarsan in Pregnant Syphilitic Women.**—C. Sauvage (*Ann. de gyn. et d'obstet.*, Jan. and Feb., 1913) has collected 130 cases of the use of salvarsan in pregnant syphilitic women. He finds that salvarsan has a special action on the liver and kidneys. It will cause the elimination of albumin from the urine and of reducing substances, sugars and urates. All observations demonstrate that salvarsan acts favorably on the kidneys and liver during pregnancy. During gestation salvarsan is eliminated by the kidneys in the same manner as in women not pregnant. But since accidents have happened it is desirable to use the greatest prudence in its administration to pregnant women. The author sums up his observations in these words. The study of the modifications of the Wassermann reactions shows that salvarsan acts directly on the syphilitic poison in pregnancy and causes an attenuation of the virus so marked that the Wassermann reaction often becomes negative. This action is inconstant and may be only transitory. The contradiction that may exist between the Wassermann reaction and the syphilitic symptoms makes the action in gestation more uncertain than usual. The action of salvarsan on the ovum is obscure. It is questionable whether the placenta does not oppose itself to the passage of the arsenic to the fetus. Most observers have not found arsenic in the blood of the child shortly after labor. After an injection given to the mother there is active and passive immunization during pregnancy. At the time of pregnancy there may be a discordance between the reactions of mother and infant, the blood of the mother being negative and that of the cord positive. Injections of salvarsan have not a deleterious influence on the duration of pregnancy. The author concludes that the use of salvarsan may have a very good effect on syphilis during pregnancy when active syphilis is present. It assures a normal pregnancy and the delivery of a healthy, well-developed child at term. In some cases there is latent syphilis in the children and in a few cases a dystrophic or malformed child may be born. Active syphilis during pregnancy justifies injections of salvarsan made carefully. Latent syphilis without active symptoms may indicate salvarsan to bring into the world a living, healthy child. Normal kidneys and liver must be guaranteed.

**Protection of the Perineum.**—The method recommended by G. Baughman (*Jour. A. M. A.*, 1913, lv, 351) is based upon the principle that by extending the legs and rotating the thighs out, skin from the buttocks and superficial fascia is put at the disposal of the stretched perineum in a much better way than the obstetrician can do by using the hand. What the perineum needs is more tissue, not more pressure from without. In pressing against the perineum with the legs flexed on the thighs and the thighs flexed on the abdomen we simply render the perineum more bloodless and increase the tendency to tear. With the woman in the lithotomy posi-

tion, as soon as the head begins stretching the perineum, bathe the perineum with sterile water and compound solution of cresol, using sterile pledgets of cotton and having the hands protected with rubber gloves that have been boiled. As the head begins to appear at the vaginal orifice, push the anterior vaginal floor backward and upward and at the same time push the occiput toward the bregma, attempting as far as possible to flex the head more and more. If the perineum seems very tight when the head no longer recedes with pains and the perineum is on the stretch, give obstetric anesthesia. Have the nurse extend the legs and at the same time evert the feet, turning the toes out and heels in, bringing the thighs as close together as possible while giving place to work. This brings the buttocks on each side inward and makes available more tissue for the perineum. Push the vulva back from the child's head with sterile moistened pledgets, beginning at the sides and always working between pains. While doing this, attempt to flex the head as much as possible and to deliver the apex of the vertex between pains. As soon as the apex of the vertex is delivered have the anesthetic pushed or tell the woman to yell if no anesthetic is used, so that her attention will be diverted from the vulva. Direct the nurse to continue the position in which the legs are together, with the feet, legs and thighs rotated outward as much as possible, and try to make delivery between pains. Give the shoulders of the child the same sort of attention, except that more room is needed between the thighs for work in the delivery; therefore the perineum should be supported by drawing forward the buttocks on each side, with the hand.

**Pituitary Extract in Obstetrics.**—W. J. Gousew (*Med. Press*, Feb. 5, 1913) has used pituitary extract in forty-eight cases at the Bakhrushin Hospital, giving 0.75 c.c. hypodermically, and repeating the dose in only two cases. Pains began two to ten minutes after the injections, accompanied by abundant micturition. The moment of the birth of the child varied from within five minutes to eighteen hours after the injection, depending on the period of labor and the position of the presenting part. Pituitary extract stimulates pains better during the second half of pregnancy, especially at its end; it gives good and reliable results in the stage of dilatation, and acts still better in the stage of expulsion. In the absence of amniotic fluid the action is prompter and more reliable than when the membranes are intact. Chloroform anesthesia, and, to a still greater extent, hypodermic injection of morphine, inhibits the action of pituitary extract. Irregular pelves, of course not beyond the medium degree of contraction, are not contraindications to the administration of pituitary extract, even in cases where the presenting part stands over the inlet. Pulmonary tuberculosis, diseases of the heart and kidneys, eclampsia, placenta previa (marginal), premature detachment of the placenta were not considered to contraindicate the administration of pituitary extract. On the contrary, edemas completely vanished in eight to eighteen hours, the quantity of albumin in the urine was considerably reduced, and in some cases it entirely disappeared. In

the postpartum period a quicker expulsion of the placenta was noticed, and, therefore, it is better to start expressing it earlier in order to avoid undesirable delay in view of the rapid contraction. In no case was any injurious effect of pituitary extract observed on the mothers or children. After parturition the uterus is well contracted; no hemorrhages were observed except in one case of rupture of the cervix where the patient was suffering from hemophilia. In case, of atonic hemorrhages pituitary extract gives reliable and permanent results, stimulating strong contractions of the uterus. The number of complications during the puerperium is not increased. According to the observations of many authors, the injection of pituitary extract may be repeated one hour after the first injection; if injected earlier, it lowers the blood pressure, thus destroying the action of the first injection.

**Do the Parathyroids Functionate in Intrauterine Life?**—Reasoning that the parathyroids of fetal pups might work vicariously in parathyroidectomized mothers, A. Werelius (*Surg., Gyn. and Obst.*, 1913, xvi, 141) selected dogs in later stages of pregnancy, possibly within two or three weeks of term. Complete thyroparathyroidectomy was done in all of them. His experiments apparently indicate that thyroparathyroidectomized pregnant dogs (in later stages) go into convulsions earlier and die sooner than nonpregnant dogs. In thyroparathyroidectomized pregnant dogs, fetal parathyroids probably do not then compensate for the mothers' glands. Possibly some glands of internal secretion do not functionate in intrauterine life. Undoubtedly, the earlier in pregnancy thyroparathyroidectomy is performed, the longer the postoperative life. The results in this work may in a sense support the parathyroid theory in eclampsia. Direct evidence of heredity as an etiologic factor in goiter is shown in this series. In fetal pups, left thyroid gland is almost always the larger.

**Ovarian Pregnancy with Full Time Fetus.**—T. B. Grimsdale (*Jour. Obst. and Gyn. Brit. Emp.*, 1913, xxiii, 115) has operated upon a woman of twenty-two years, married three years, during which time she has had an abdominal tumor. She had had two still-births and one normal child within two months. The specimen removed consisted of the left ovary and tube and mesosalpinx. When opened, the ovary was found to contain a fetus and placenta. The period of development of the fetus was shown by the x-ray to be full term. Lack of a history of amenorrhoea and of pain suggests the possibility that this gestation was coincident with one of her uterine pregnancies.

#### GYNECOLOGY AND ABDOMINAL SURGERY.

**Value of Cystoscopic Examination in the Diagnosis of Operability of Cancer of the Cervix.**—P. Cruet (*Ann. de gyn. et d'obst.*, Jan. and Feb., 1913) concludes from his studies of cancer of the cervix uteri, that invasion of the planes of the bladder and ureters is a contraindication to operation. Vaginal and rectal examination are

often insufficient to ascertain whether these tissues are involved. Vesical troubles are of no diagnostic value. Cystoscopy alone will tell the condition of the bladder walls, and the presence of compression of the ureters, by showing projection of the bladder walls at some location where the initial growth has taken place, circulatory disturbances, deviation of trigonum and formation of vesical diverticula, formation of folds, and sulci in the walls. Carcinomatous nodules may be discovered in this manner; final diagnosis occurs only during operation. Compression of the ureters is shown by slow flow of urine, irregularity of the stream, force of ejaculation, spasm of the orifices. The absence of these symptoms and signs obtained by cystoscopy in the presence of an infiltrated pelvic floor will give notice that we are not dealing with a simple salpingitis or inflamed pelvic floor. The signs of ureteral compression are very frequent in advanced cases and contraindicate operation when no modifications of the pelvic floor are felt.

**Skin-grafting Operation for Cancer of the Breast.**—W. S. Halstead (*Jour. A. M. A.*, 1913, lx, 416) describes and explains the recent modifications in his operative treatment of cancer of the breast. The incision down the arm, made shorter and shorter, was finally abandoned. The vertical cut to the clavicle is made as short as feasible and when considerable skin has been removed above is omitted. Not infrequently the only incision of the skin is the circular one surrounding the tumor, but as a rule the one or the other of the vertical incisions has been made. By means of the two vertical incisions, one above and one below, the dissection of the axilla is, of course, facilitated. Thus the triangular flap has been definitely abolished. The skin of the outer flap between the two vertical incisions is utilized primarily to cover completely, without any tension whatever, and redundantly the vessels of the axilla. The edge of this flap is stitched by interrupted, buried sutures of very fine silk to the fascia just below the first rib in such way that the skin partly envelops the large vessels. Then, along the entire circumference of the wound, the free edge of the skin is sutured to the underlying structures of the chest wall, the wound being made as small as desirable in the process of closure, and tension on the upper or axillary part of the outer flap assiduously avoided. Considerable traction may, however, be exercised on the mesial flap and on the lower portion of the outer flap. The grafted defect should usually extend to the top of the axillary fornix. Thus the thoracic or inner wall of the apex of the axilla is always lined with skin-grafts. The arm is adducted 90 or more degrees during the stitching of the wound and is not included in the dressing. Only the gentlest pressure is exerted by the bandage holding in place the gauze handkerchiefs which should be evenly applied with solicitous care. Particularly to be avoided is the placing of a wedge of gauze in the axillary fornix, and the using of this as a kind of fulcrum to be bridged over by the adducted arm. Drainage is unnecessary. Movements of the arm as free as possible are encouraged after the second day. Among the advantages of this method is the fact that an almost

unlimited amount of skin may be removed. It is better to remove too much skin than too little, for the mistake of excising an insufficient quantity is quite fatal to the patient's chances of recovery. Skin-grafts present a definite obstacle to the dissemination of carcinomatous metastases. Recurrences in the deeper planes may be promptly detected under the thin, grafted skin. These should be burnt away, down to the pleura if necessary, with the actual cautery. One may be compelled to resort to a plastic operation when the tumor has extended so far into the axilla as to make it necessary to provide skin from elsewhere to assist in covering the axillary vessels. Under these circumstances a more or less vertical cut up the neck on the opposite side has sufficed to release the skin which seemed available.

**Thrombosis and Hematoma of the Vulva.**—Andre Van Cauenberghe (*Bull. de la Soc. Belge de gyn. et d'obst.*, vol. xxiii, No 8, 1913) says that hematomata of the vulva and vagina are found during and after labor, and rarely outside of pregnancy. In the non-pregnant woman they may be due to brutal coitus, great effort, violent cough, a blow, etc. In pregnancy there is a predisposition to them owing to the relaxation of the tissues, and the accident occurs from falls and blows. During labor the compression prevents the lesion from being recognized until after the birth of the child, when the large part of the hemorrhage occurs, producing a tumor occupying the vulvar region. They may also occur during the course of an operation on the perineum and cervix. These hemorrhages may be intrafascial, extending through the labia majora toward the perineum and perirectal tissues, or suprafascial, when they appear distending the cellular tissues of the pelvis even into the retroperitoneal region. The suprafascial hematomata are difficult of diagnosis and rare. The author observed a case after a very prolonged labor which did not appear until the day after delivery. The rational treatment of these lesions consists of expectant treatment until the hemorrhage has ceased and until the lochia have ceased to be excessive. After this the tumor may be incised, all the clots turned out, the cavity packed with antiseptic gauze, and allowed to granulate. These lesions also occur after immediate repair of the perineum.

**Typho-tuberculous Tuboovarian Abscess.**—Reporting a case of tuboovarian abscess which was found to contain both typhoid and tuberculous organisms, W. D. Fullerton (*Surg., Gyn. and Obst.*, 1913, xvi, 180) says that in posttyphoid pelvic abscesses, the B. typhosus probably plays a more important rôle than is suspected. Puerperal infections coincident with or shortly following a typhoid infection may often have the typhoid organism as a causative agent. With these conditions, a careful inquiry into the past history for typhoid infections will probably bring out some interesting results, especially when coupled with a careful bacteriological examination of all pus from pelvic abscesses. With a previous pelvic infection, which is more or less destructive and lowers the resistance of the parts, one would naturally more often expect to find a secondary

infection. The simplest and most plausible mode of infection is by way of the blood stream. Hexamethylenamin, which has proven so useful in preventing posttyphoid cystitis, cholecystitis, etc., though its excretion by the uterine and tubal epithelium has not yet been proven, may here be found to be of advantage, at least in the prevention of such a posttyphoid complication.

**Improvement of Results in Cancer Operations.**—T. Abbe (*Surg., Gyn and Obst.*, 1913, xvi, 185) says that to get better results we must enforce certain well-established conceptions: that early eradication is at present the only reliable method of treating cancer, and operation in general the most satisfactory method of eradication, though energetic caustics and radiotherapy have their distinct fields. That painstaking diagnosis to select the cases suitable for curative operations, complete eradication at the primary operation, with the minimum manipulation, will allow fewer recurrences. To get earlier cases for operation we must educate the medical student to appreciate the importance of early diagnosis and prompt radical treatment. We must educate the practitioners through the medical journals to the prevalence of cancer, so that their eyes will be open to seek an early diagnosis in cases with the slightest suspicion of cancer, or even in the prolonged troubles of many types that have not yet raised the suspicion of cancer. And we must educate the women to seek routine semiannual examinations of breasts and uterus at the hands of their accoucheurs.

**Transfusion in the Treatment of Ruptured Tubal Pregnancy.**—R. M. Green (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 270) has employed direct blood transfusion in two cases and regards it as of value when hemorrhage is excessive. It may to advantage be employed in such cases as soon as possible after the hemorrhage is checked, and under the original anesthesia. Even if the patient's life is not in imminent danger, such transfusion, in serious cases, at least does no harm, minimizes shock and expedites convalescence. In the technic of transfusion, if the Elsberg cannula be employed, it seems advisable not to apply a clamp proximally to the donor's artery unless the compression of the cannula proves insufficient to control the flow of blood. It seems also advisable not to mobilize the donor's artery completely until the moment when the anastomosis is made, since by this method troublesome hemorrhage from minute arterial radicles may be avoided.



# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

#### SECTION ON PEDIATRICS.

HENRY L. SHAW, M. D., *of Albany, in the Chair.*

DR. L. EMMETT HOLT of New York presented a paper on

#### THE WASSERMANN REACTION IN VARIOUS CONDITIONS IN CHILDREN.

He stated that the Wassermann reaction not only enabled one to be certain of the existence of syphilis in many doubtful conditions but also excluded syphilis in many cases where it was formerly suspected. It was the consensus of opinion that latent as well as active syphilis gave a positive response to this reaction. It was also the general belief that children who reacted positively should receive the benefit of antisyphilitic treatment. Like all laboratory tests the Wassermann reaction was not infallible. Positive reactions might be met with in certain cases of scarlet fever and in infection with the trypanosomes; neither of these conditions would be likely to be confused with syphilis. Errors in faulty technic must be taken into account. It was absolutely essential that the reagents used should be right; that the antigen be good and well tested; that the sheep or human corpuscles be fresh and properly washed. Errors occurred most frequently on the positive side so that children tested for syphilis were pronounced syphilitic when they were not. A series of observations had been carried on in the Babies' Hospital in order to answer the question as to the frequency of syphilis in the ordinary run of hospital infants as well as in some special conditions. The Noguchi modification of the Wassermann reaction was used in all of their tests. This method had the advantage in infants of requiring much less blood than the Wassermann test. All of the tests had been made at the Rockefeller Institute under the supervision of Dr. Noguchi. During the period of their observations thirty-four cases of hereditary syphilis had been admitted for treatment. In thirty-one of these blood tests were made and thirty gave a positive reaction. The infant not responding had undergone inunctions of mercury for a period of three months. Previous

treatment with mercury did not seem to affect the reaction unless it had been continued for a considerable time and with regularity. The positive reaction in nine of these cases some of which had been treated from birth showed how incomplete and uncertain was the cure of syphilis effected by mercury and potassium iodide. Of 178 tests made in hospital patients showing no definite signs of syphilis, positive reactions were obtained in but eleven and five of these were shown upon fuller investigation or subsequent findings to be pretty clearly syphilitic. Two of the remaining four were doubtfully so. The great proportion of congenital deformities had no relation to syphilis since not a single positive reaction was obtained in fifty-six consecutive cases. Of sixty-two patients suffering from malnutrition only five gave a positive reaction and were included in the group mentioned above. Of the remaining fifty-seven nearly one-third had very considerable enlargement of the liver or spleen or both. Since these cases examined were selected from a much larger number as those most likely to be syphilitic, they could not regard syphilis as a common cause of marasmus in the patients admitted to the Babies' Hospital. Since the error was almost invariably on the positive side the technic of those who found a large percentage of positive reactions among marasmus patients in institutions was open to suspicion. It was evident that mere swelling of the liver and spleen was not to be regarded as a very important sign suggestive of syphilis in infants suffering from malnutrition. Both were much more likely to be seen with rickets than with syphilis. Mere swelling of the superficial lymph nodes, whether occurring alone or with swelling of the liver and spleen had no special significance. The only glandular swellings that did suggest syphilis were those of the epitroclears when this occurred without any peripheral lesion to explain it.

#### DISCUSSION.

DR. L. E. LAFETRA of New York related his experience with the Wassermann reaction at Bellevue Hospital. They employed only the original method of Wassermann. All suspected cases were submitted to examination and all cases in which there was an underlying luetic condition. They had submitted eighty-two cases to examination two or more times. They found syphilis present in forty-four cases in which it was suspected and in fifteen cases where they had thought it was not present. The spleen was enlarged in three-fourths of their cases that gave a positive reaction. In young infants a large spleen need not lead one to suspect syphilis. In the fifteen cases not supposed to have syphilis the family history was positive in two cases and negative in nine. One should not put too much reliance on a negative family history. As an assistance to diagnosis the Wassermann test was of great service especially in skin eruptions and stomatitis and should be used in all doubtful cases. Observations should be made as to the results of treatment with the mercurials and neosalvarsan in children.

DR. THIBAUDEAU of Buffalo said that in his tests the original method of Wassermann had been carried out. His experience led him to conclude that when the Wassermann reaction was positive this might be considered good evidence that syphilis was present. When the reaction was negative the conclusion was not so positive that syphilis was absent. He had examined several syphilitic fetuses or infants dying very shortly after birth in which the reaction was negative. He explained this by the fact that the infection was overwhelming and hence the formation of antibodies had not taken place. When they obtained a doubtful reaction or what they called a positive-negative reaction in nervous conditions they were coming more and more to acknowledge it as positive. He cited an instance of a child apparently healthy but born of a mother who had an active lesion. The child was now developing a gumma.

DR. JOHN E. WELCH of New York called attention to the possible sources of error in the technic of these tests. In the original Wassermann method one source of error was the complement content of guinea-pig serum. Frequent bleeding of the same pig led to a decrease in the complement content of the serum. In jaundiced cases a weak Wassermann reaction was sometimes obtained. Many positive Wassermann reactions were obtained in children suffering with malnutrition and with bile salts in the blood. These sources of error should be kept in mind.

DR. LOUIS C. AGER of Brooklyn presented the

#### CLINICAL REPORTS OF TEN CASES OF PULMONARY TUBERCULOSIS IN CHILDREN TREATED WITH MIXED BACTERINS.

He stated that recent investigators had shown that the tubercle bacilli alone might produce destructive tissue changes in the lungs. However, it was generally believed that such changes were the result of secondary invasion of various pyogenic organisms. If the process was entirely local the use of bacterial vaccines was indicated, theoretically at least. In spite of the recent reports of Pettit and Brown, the writer was convinced by the investigation of Avery that the secondary organisms were practically never found in the blood of phthisical patients even in the terminal stages of the disease. If that were true pulmonary tuberculosis was almost entirely a local process and the mixed vaccines ought to be of benefit. The writer had chosen ten patients all showing active lesions and representing different types and stages of the disease. To these he administered Mulford's Mixed Influenza Bacterin containing the bacilli of influenza, of Friedlander, of the pneumococcus, streptococcus and staphylococcus, as well as diphtheroids and the micrococcus catarrhalis. This product was used because it contained the organisms occasionally found in the washed specimens of sputum. After relating the histories of these cases, the writer concluded that no definite reactions were observed in any case. In four cases there were slight changes that might have been attributed to the treatment. The only positive deduction that could be drawn from these observations was that

this particular bacterin bore no special relation to these particular cases. It was quite possible that autogenous vaccines might have shown a different reaction.

#### DISCUSSION.

DR. EDWARD G. WHIPPLE of Rochester regretted that Dr. Ager had not met with better success. When tuberculosis was sufficiently far advanced to be recognized there was present a mixed infection but until they could calculate the amount of infection and the amount of bacterins they could not expect to get definite results. Tuberculosis was only truly incipient in childhood and it was important that pediatricians should unite in the campaign for clean milk and sanitary surroundings for children. It was only by keeping the resistance of the child up to the proper level that they could hope to combat tuberculosis in childhood. It did not seem to him that the giving of mixed bacterins was scientific medicine or good therapeutics. Again, until they found a specific treatment that could be put in the hands of the general practitioner they must continue to use general treatment. The plan used in the Tuberculosis Hospital of Rochester was the treatment of the tuberculous patient and the institution of preventive measures. The treatment of tuberculosis in children did not differ from that in adults. In their institution the child received a school education in an open air school. Some were under home treatment but this had proved unsatisfactory. They sent children from homes where a parent was afflicted with the disease to a preventorium where they did their school work in the open air, took proper rest, and graduated exercises. After they left the school a follow up system was used. Relapses were often due to home conditions. They removed adenoids and enlarged tonsils, treated diseased ears, and corrected orthopedic defects. The anemic poorly nourished child nearly always had tuberculosis. He therefore made a plea for the segregation of adults, the medical examination, not inspection, of school children, care of the tuberculous child for from six months to one year, and insisted that these measures should be applicable to the rich and the poor alike.

DR. H. J. BRAYTON of Rochester had had no experience with the bacterins but thought they might be useful in cases of the chronic type. Cases doing well on the routine treatment should be let alone. Improvement was especially noticeable among the children in the open air schools. If the children could be under observation longer better results would be obtained. In their sanatorium they isolated the advanced cases and kept the incipient cases by themselves. They got most of their cases in the incipient stage. The cases should be kept under observation for one year.

DR. MATTHIAS NICOLL of New York felt gratified that Dr. Whipple had spoken against this so-called specific therapy but he had not spoken strongly enough. Such a shotgun mixture of bacteria was absolutely absurd.

DR. L. EMMETT HOLT emphasized what Dr. Nicoll had said. He

did not agree with the writer of the paper that such results should be published. Such therapy did harm by tempting the unwary to pin faith on a specific to the neglect of routine measures of treatment. Furthermore it was not wise to employ such a commercial product and the recommendation of the commercial product of any firm was out of place in such a meeting.

#### RATIONAL TREATMENT OF HEMORRHAGIC AFFECTIONS IN CHILDREN.

In the absence of DR. LEGRAND KERR of Brooklyn this paper was read by title.

#### DISCUSSION.

DR. JOHN E. WELCH in discussing the subject of hemorrhagic affections in children, said that the manner in which the bleeding began was familiar to all. Any persistent bleeding in an anemic child called for definite and well directed treatment. Different methods had been employed, the injection of normal human blood serum, of human blood, the serum from animals, as the horse or sheep. It was well known that serum from a different species caused a reaction. This was illustrated by the fact that diphtheria antitoxin produced a slight reaction in 80 per cent. of the cases injected. The effort to overcome a serum sickness was an additional strain on the system of a child already depleted by loss of blood. With regard to the etiology of hemorrhagic disease, he did not believe it was a blood disease but rather a disease of the general tissues produced in many ways and causing a change in the endothelium of the blood-vessels. The increased blood pressure, the altered state of the blood, and the change in the endothelium were secondary to some general disease which might be the result of mineral poison or syphilis and had been observed to result from rattlesnake venom. After a long period of tissue starvation bleeding began. After reviewing the theories of coagulation advanced by Dr. Howell of Johns Hopkins as evidence that the hemorrhage was not due to conditions in the blood itself, Dr. Welch advocated the use of normal human blood serum because it had no untoward effects, was easily obtained, and very effective. In anaphylaxis there was a reduction in the complement of the blood and a decrease in blood pressure and the addition of the serum from an animal further reduced the complement and hence was a mistake. He believed that normal human blood serum served to control hemorrhage chiefly through its value as a food. In a series of premature infants upon which he had made observations those who were given normal human blood serum survived. They were now working on the problem of serum precipitation by acetone and ether in the hope of obtaining a product easily soluble in water and which would control hemorrhage and successful work in this line had been reported.

DR. L. E. LAFETRA thought it would be of interest to some of them to know of the work that Dr. Schloss had done in the use of blood from a member of the family or a near relative. He had used the whole blood in fifteen or twenty cases. It was surprising how readily the whole blood was absorbed without clotting when injected into the back. It was entirely absorbed in two days. Dr. LaFetra cited the case of a boy, seven years of age, who was suffering from severe purpura. He was given an injection of serum, then a transfusion, after which he improved for three weeks. He then relapsed and 30 c.c. of whole blood were injected four times during a period of two months, since which time the boy had remained well. In two cases of hemorrhage in new-born infants 20 c.c. of whole blood were used for the first injection and 30 c.c. for the second after which there was complete cessation of the bleeding. The great advantages offered by the whole blood were that it took less time to procure it and that it did not take as large a quantity of blood as when the serum alone was used. There was no reaction following the administration of human blood. A combination of the method of Dr. Welch and that of Dr. Schloss could be used, giving the first injection of whole blood and following that by an injection of serum.

DR. JOSEPH R. CULKIN of Rochester read a paper on

#### DIPHTHERIA.

All agreed that the bacteriological examination was the only sure way to diagnosis diphtheria, but when one got a negative report, or even two or three of them in a case of manifest diphtheria, it was important for the clinician to rely upon his own diagnosis and to use antitoxin freely until the case was cleared up, when he might get a late positive culture. A negative culture might lead a family prejudiced against antitoxin to forbid its further use, and so valuable time might be lost in waiting for more cultures. When the writer met this frame of mind he made it a practice to use a large initial dose in the first instance. He had had negative cultures reported in cases that afterward developed paralysis characteristic of diphtheria and also in laryngeal cases with no membrane in the pharynx. He would forbid the use of antiseptics until after the culture was taken. There was nothing to be said against the culture method, but the necessity of relying upon the clinical diagnosis and treating the case energetically while waiting for a return from the culture should be emphasized. The nasal cases were a potent factor in keeping up the spread of the infection and should be sought for with great care, especially in institutions. Immunity was powerless against those cases, as the immunity ran out. Conditions which produced epithelial necrosis and much membrane which resembled diphtheria should teach the clinician to rely upon well-made cultures for his final diagnosis, but he should use antitoxin until the diagnosis was established. In marked laryngeal and tonsillar cases at least 10,000 units should be used; in nasopharyngeal case 15,000 units; and in laryngeal cases 20,000 units, to be repeated in twelve hours



if results were not apparent. It was well to examine the lungs, which might be invaded as the throat was clearing; a fatal termination could only be avoided in bronchopneumonia by large doses of antitoxin. Immunizing doses of antitoxin might be given to the same individual a number of times without causing any untoward symptoms. The prejudice against antitoxin did not seem to abate and all sorts of conditions were charged to it, but the use of a sufficient dose early would do much to diminish this feeling. In cases seen in an almost moribund condition, it was futile to use antitoxin unless one was prepared to use enormous doses at once, as less than these large doses only tended to have antitoxin charged with the deaths sure to follow.

#### DISCUSSION.

DR. MATTHIAS NICOLL, JR. of New York congratulated Dr. Culkin on his firm attitude in regard to the importance of antitoxin at the earliest possible moment that diphtheria was suspected. No real harm to the patient would follow a dose of antitoxin in any event and frequently a grave danger might be averted. In severe cases the clinical findings should be the guide of the physician and on no account should a delay of eighteen hours be tolerated while waiting for culture returns. As regarded the inconsistencies of the culture reports, they were sometimes not properly taken. Purely laryngeal cases especially at first frequently gave negative results if the swab was taken in the usual way. If, however, the swab was slightly bent and a culture made directly from the interior of the larynx this error would be largely avoided. Young children convalescing from scarlet fever, especially in a hospital, who had a profuse purulent nasal discharge, should have a large dose of antitoxin immediately. The importance of making direct smears in addition to a culture has not been generally recognized; this procedure was especially applicable to the obscure ulceromembranous cases referred to by Dr. Culkin. In regard to immunization, they gave 1,000 units of antitoxin to every case of scarlet fever on admission to Willard Parker Hospital; if the patient was exposed to diphtheria the dose was repeated at weekly or longer intervals. The same procedure was carried on in measles epidemics. The amount of antitoxin suggested by Dr. Culkins was somewhat larger than was given as a routine measure at the contagious disease hospitals in New York. He believed that more than 10,000 units in children were rarely necessary, since with this dose the blood was known to contain an amount of antitoxin which was more than a hundred fold sufficient to neutralize any conceivable amount of toxin which was capable of being neutralized. In regard to a second dose of antitoxin in twelve hours, Dr. Park had had charts prepared to demonstrate the time required for antitoxin to reach the blood stream and the amount of antitoxin contained in the blood at different periods of time. It was found that the antitoxin reached the blood stream slowly but steadily, increasing up to the third, fourth or fifth day after the injection and then slowly decreasing.

Therefore, if a second dose was given twelve hours after the first the beneficial effects attributed to it really were due to the continued absorption of the first dose, the second dose only gradually contributing its share. A second chart showed the results in four cases of diphtheria which received 10,000 units of antitoxin intravenously. It showed very plainly that in this method a very large amount of antitoxin went into the blood stream at once and immediately decreased, yet there was a sufficient quantity in the blood for a week or more. If one felt that the initial dose was not sufficient, a second dose might be given but it should be given intravenously. Antitoxin should be given intravenously in cases which were in desperate straits. With regard to the beneficial effects of antitoxin in complicating bronchopneumonia, Dr. Nicoll said he could not conceive of antitoxin influencing disease invariably caused by an organism other than that for which it was a specific.

DR. NICOLL was not prepared to state that intravenous injection was perfectly safe, but in their wide experience they had never had an accident.

DR. JEROME S. LEOPOLD of New York wished to congratulate Dr. Culkin and to emphasize what he had said in regard to early and large doses of antitoxin. If a child was exposed at the end of ten days after an immunizing dose of antitoxin, a second immunizing dose should be given. There was a difference of opinion as to the size of the dose in different localities. In Boston they used very large doses. As to the quarantine of diphtheria cases, interesting observations had been made in Germany where it was found that the sediment of centrifugized urine contained diphtheria bacilli in practically every case and in some instances even after three months. The question arose as to whether all cases did not have bacilli in the blood and as to how long they might remain infective.

DR. THOMAS J. WALSH of Buffalo wished to add his commendation to the stand taken by Dr. Culkin, especially in regard to the nasal and the measles cases which so often showed diphtheria on culture. Anaphylaxis was a very real thing and in those cases that were asthmatic von Pirquet had suggested the von Pirquet test and if a marked reaction took place anaphylaxis should be watched for. Another way was to give a small dose first and note the effect and then follow it by a larger dose. In case anaphylaxis did occur atropine should be administered. The use of antitoxin intravenously was bound to come to the front. The preservative in the antitoxin if given intravenously might have a bad effect. The intravenous method was not an easy one. The intramuscular method was less painful than the subcutaneous and the intragluteal injection would be found convenient. Abroad they had a trick of performing extubation by suddenly tipping the child forward and often the tube slightly loosened would fly out. A point about tracheotomy was that of making a transverse incision between the rings of the trachea. This technic was easier than that in general use and gave satisfactory results. In the neuritis of diphtheria, the paralyses, heart lesions, etc., antitoxin was the best remedy they had thus far. By intro-

ducing a spiral into the tracheotomy tube they could remove the membrane more easily. Contrary to what one might expect, digitalis in diphtheria had been found useful in auricular fibrillation.

DR. CLIFFORD MERCER of Syracuse read a paper on

#### RECURRENT VOMITING IN CHILDREN.

Although reports of recurrent vomiting come from widely distributed communities, the condition can hardly be classed as a very common disease. But it undoubtedly occurs more frequently than it was recognized. Recurrent vomiting may be defined provisionally as a toxic neurosis, characterized by uncontrollable but self-limited attacks of vomiting, attended with great prostration and marked wasting, lasting for from a few hours to several days, recurring at intervals of weeks, months, or nearly a year, and tending to cease at puberty or to be replaced in adult life by migraine. Predisposing and exciting causes were mentioned while etiological theories were considered more fully. Acidosis was shown to be an incidental effect rather than a fundamental cause. Acidosis occurs in many pathological conditions and may be present in the apparently well. It was absent from the prodromal stage of recurrent vomiting and not necessarily present in later stages. Acidosis may be produced by cutting out glucose and other carbohydrates from the diet of a child subject to recurrent vomiting without causing an attack to develop. On the other hand, creatinuria has gradually become more marked in the same child just before an attack and has thus enabled the observer to predict approaching symptoms a day or two before any have shown themselves. Both acidosis and creatinuria indicated the presence of hepatic insufficiency. The liver has lost its neutralizing or filtering power against intestinal and endogenous toxins. Such poisons are probably causes of recurrent vomiting while creatinuria was an early associated occurrence and acidosis a later one. Symptoms, course, prognosis and diagnosis of the disease were briefly dealt with. The history of a case of migraine was compared with that of a case of recurrent vomiting as a matter of contrast in diagnosis.

Treatment with bicarbonate of soda, based upon the theory of an etiological acidosis has been successful when begun in the prodromal period and a failure when begun too late in the attack. This treatment is not simply alkaline, but is also one of dietetic and liver rest, by fasting, and toxic elimination, a line of care which is suggested by the occurrence of essentially the same events in the natural course of an attack, catharsis in treatment replacing emesis in the disease. In the intervals much can be done to improve the condition of patients by eliminating from their lives, so far as may be, all factors known to be etiological in recurrent vomiting, as, for instance, constipation, overeating, questionable diet, occasions for overexcitement, too much indoor life at home or in school, eyes-strain, adenoids, and, in fact, anything, physical or psychical, which may lower resisting power or be a source of reflex

irritation, and, on the other hand, by using all available means to build up resisting power and develop a hygienic and sane mode of living.

#### DISCUSSION.

DR. GEORGE E. CLARK of Skaneateles wished to report a case of recurrent vomiting. The trouble began with indigestion when the infant was two months of age and was repeated at the age of five months when cow's milk was first given. Disturbances occurred at various periods during infancy. At the age of six years the attacks recurred at intervals of three months. The parents were very careful of this child's diet and it seemed certain that the trouble was not due to error of that nature. The attacks in this instance seemed to be precipitated by nervous excitement. The only thing that gave even slight relief was menthol. Arseniate of strychnine was used to keep up the pulse. Experiments with dogs and cats had shown that excitement resulted in suspended digestion for the time being and if this was the case why could not the interference with functions of any viscus be explained in the same way.

DR. CHARLES L. HINCHER of Rochester discussed the problem of the etiology of this affection and suggested that possibly the adrenals had something to do with the subject as they played an important part in sugar metabolism.

DR. THOMAS S. SOUTHWORTH referred to the case in which excitement gave rise to these acute attacks. The vomiting indicated the attempt of the system to eliminate some unfortunate product of metabolism. It would seem, then, that active free catharsis was indicated. When free catharsis was established the vomiting stopped. The desired result might be obtained from calomel in some cases. Castor oil could not be given. The one laxative that seemed to fit the situation was citrate of magnesium. If the child could not tolerate large doses a tablespoonful could be given every twenty minutes or half hour. A certain amount might be vomited but a certain amount would pass through the pylorus. It had been his experience that the vomiting subsided within twenty-four hours in his cases, though it might be that the cases were of a mild type.

DR. MERCER wished to emphasize the necessity of elimination early in the attack and of studying the prodromata and treating the patient before the attack.

DR. DEWITT H. SHERMAN of Buffalo wished to emphasize what had been said about watching to prevent the attack but he wished to emphasize what had been said about the neurosis more particularly. He cited three cases in which a cure was obtained by having the patient's eyes examined and fitted with properly adjusted glasses. The condition of the eyes might influence the metabolism in children.

DR. MERCER could confirm what Dr. Sherman had said, in regard to the importance of having the eyes examined in these cases.

DR. HENRY A. GRIBBEN spoke on the

## DIFFERENTIAL DIAGNOSIS OF THE PARALYSES OCCURRING IN EARLY LIFE.

It was his purpose to formulate a working guide in the diagnosis of paralyzes of the extremities which would aid in the diagnosis of those conditions with which the physician was most often confronted. These paralyzes might be roughly divided into three groups: 1. The pseudopalsies, (2) the spastic palsies, and (3) the flaccid palsies. Among the pseudopalsies the most common conditions were the immobilities due to pain. Injuries would often simulate paralysis, polyarthritis, and osteomyelitis among the inflammations and scurvy and rickets among the diseases.

The pain paralyzes were positively differentiated by single points of tenderness, evidences of local injury and the ability to move the fingers or toes. The false paralyzes of rickets might be differentiated by the fact that motion was not absolutely lost and by the other stigmata of that disease. They had also an apparent flaccid paralysis with no loss of reflex. The second group was illustrated by the cerebral palsies. Rigidity of the extremity, exaggeration of the deep reflexes, no reaction of degeneration and no atrophy, were symptoms common to all types and were distinctly opposite to the symptoms of the flaccid type. In general spasticity meant cerebral lesion, or lesion of the lateral or posterior tracts of the cord. Flaccidity meant anterior cord disease or peripheral nerve lesion. The cerebral group might be hemiplegic, paraplegic, or diplegic, very rarely monoplegic. Sach's classification according to the onset was a distinct aid in diagnosis. The prenatal forms due to defects and intrauterine injuries were best known as Little's disease and were paraplegic or diplegic with characteristic cross-legged progression. This term was applied to birth injuries. The acquired form might be due to hemorrhage, embolism, or thromboses and was more likely to be hemiplegic. There was also the acute form of meningo-encephalitis which gave rise to the same symptoms. The spinal type of spastic paraplegia was differentiated by the fact that it was distinctly hereditary, came on later than the eighth year, was slowly progressive, lacked the mental deficiency so common to birth palsies, and had no history of birth trauma. Other lesions giving rise to spasticity were cerebral tumor, abscess, and cyst. The spastic paralyzes due to cord lesions might be grouped under injuries, inflammations, and diseases. Under injuries were included traumatic hemorrhage, fractures of the vertebræ, and compression due to spinal caries. Myelitis was the type of inflammation; tumor tubercle and gumma of general disease. Taking myelitis as the type they had the positive signs of sensory disturbance, sphincteric involvement and involuntary spasmodic twitchings. These symptoms were pathognomonic of myelitis. Syphilis of the cord might have all the symptoms of myelitis, but with the difference that it involved the greater portion of the cord and the intensity of the symptoms was slight as compared with the extensiveness of the area involved. There were certain rare conditions which should be

tucked away in the subconscious mind such as disseminated sclerosis, Friedreich's ataxia, and hysteria. The third or flaccid group was made up of spinal and peripheral nerve lesions. Flaccidity, atrophy, diminution of reflexes and change in electrical reaction were the cardinal signs that distinguished this group. Anterior poliomyelitis must be differentiated from multiple neuritis as the peripheral type. In the subacute form of poliomyelitis the picture might be that of progressive muscular atrophy; until retrogression it might be impossible to distinguish the true condition. In Landry's paralysis, usually rare in children, the rapidly ascending palsy and involvement of the abdominal and thoracic muscles would be positive signs to differentiate it from both poliomyelitis and polyneuritis. Tumors of the cord gave rise to symptoms similar to myelitis but were more often unilateral having radiating pains as another sign. Birth palsies must be differentiated from birth fractures.

A case was reported in 1906 in the *Archives of Pediatrics* in which a child of eighteen months became suddenly ill with fever and unilateral convulsions. Following this, there developed spastic paralysis of the leg and flaccid paralysis of the arm on the same side. The onset and hemiplegia was characteristic of the cerebral type while the resultant paralysis simulated involvement of the cord. No explanation was given and the writer had been unable to find any other case reported.

#### DISCUSSION.

DR. WISNER R. TOWNSEND of New York said that the paper was very complete and needed no discussion. Since he had been asked to discuss this subject he had been watching the cases that came into the Hospital for the Ruptured and Crippled for errors in diagnosis; it was surprising how many of these errors there were. The fact that he found most striking was that many came with the wrong diagnosis because of a lack of previous history. A careful history of the case gave one a very different idea when he came to examine the patient. He had found that in rachitic cases where there was a pseudoparalysis that there was sometimes complete loss of motion. It was astonishing how terrifying electricity was to most children; he had produced two attacks of hysterics by using it and had abandoned it. One could learn most by the careful examination of individual muscles. Peripheral neuritis was rather rare in young children. It was odd that paraplegia in some cases had led them to make a diagnosis of Pott's disease which turned out to be correct. In hysteria or so-called hysteria the lack of coordination or proper balance between the symptoms helped to make the diagnosis. The ordinary tests by heat, pins, etc., had their value.

DR. GEORGE DOW SCOTT of New York said that many apparent paralyzes were not true types. He mentioned two cases seen during the last twelve months occurring in children of about twelve months to two years. The mother noticed after a prolonged time of con-



stipation and of intestinal disorders that the child began to drag one leg and could bear no weight upon it. A physical examination showed a furred tongue, meteorism, intestinal fermentation, a slight rise in temperature, but no Köing's sign, nor were the knee-jerks absent; they were intensified somewhat, under proper diet, hygiene and laxatives. The condition cleared up from within twelve to forty-eight hours. He liked to call such cases pseudoinfantile paralysis.

DR. HENRY A. GRIBBEN of Poughkeepsie had never seen cases of rickets that did not have some slight motion though the children could not stand. The question arose as to whether a pseudospinal paralysis might not be a toxic neuritis. Spinal puncture would clear up such a case.

DR. ABRAHAM JACOBI said it was important to gather stray cases. He had had a very rare case some fifty-five years ago, one of hysterical paralysis. There was no paralysis except of the right upper eyelid. This was so rare and unique that it was worth while mentioning.

#### MONGOLIAN IDIOCY.

DR. GEORGE T. IMRIE of Rochester presented this case and asked for opinions in regard to diagnosis and prognosis. The patient was a baby, nine months of age, the sixth child of healthy parents. At birth the child was normal in appearance and weighed 8  $\frac{3}{4}$  pounds. The infant was nursed until three months of age and then put on modified cow's milk. At the age of three months the patient had had bronchitis. She had been unable from the time of birth to hold her head as a normal child did. When placed in the sitting posture she could not now hold up her head and cried. She had attacks of cyanosis. The abdomen was large and there was a bulging over the sternum. There had been a heart leakage.

#### DISCUSSION.

DR. CHARLES HERMANN of New York said that the data were characteristic. He had recently seen a case in the hospital of this type of Mongolian idiocy with congenital heart lesion. The case to which he referred was unusual in that the temperature reached 109.4. No autopsy was obtained, but a postmortem would not have thrown any light on the causes for such a temperature. It was probable that there was some defect in the regulating center.

DR. GEORGE H. VAN GAASBECK of Kingston said that about 50 per cent. of these cases had congenital heart trouble and they succumbed easily to pneumonia or tuberculosis.

DR. THOMAS S. SOUTHWORTH said that so far as the prognosis in the present case was concerned, that with the early inability to hold the head, it was very bad. The head only measured 15  $\frac{5}{8}$  inches in circumference and it seemed probable that if the child survived she would be microcephalic.

DR. CONWAY A. FROST of Utica had had two such cases. These cases nearly all succumbed to pneumonia.

DR. ELIAS H. BARTLEY of Brooklyn read a paper on

#### THE USE AND ABUSE OF SUGAR.

The sugars were among the most valuable articles of human diet. They yielded their heat and energy in the body with the least expenditure of the least effort on the part of the organs of digestion and assimilation. This was especially true of the hexoses as met with in glucose and invert sugar. But this very characteristic might make them harmful when used in large quantities. It was the abuse of the sugars and not their proper use to which he wished again to call attention. About twenty years ago he called attention to the abuse of sugar in a paper read before the Medical Society of Kings (*Brooklyn Medical Journal*, 1889, p. 14). He was then convinced by clinical evidence of the harmful and far-reaching effects of the excessive use of sugar upon the digestive organs, the mucous membrane, and upon the general health of growing children. The many years of observation since that time had only served to confirm the ideas then expressed. The injurious effects to which he then referred were irritation of the gastric mucosa, gastric catarrh, interference with the digestion and absorption of fats and proteins, the production of excessive fermentations with the formation of irritating organic acids, attacks of so-called "bilious" vomiting, acid intoxication, anemia and general malnutrition. In this article he attributed these results chiefly to the fermentative changes, especially of the hexoses as invert sugar, and of glucose taken as such. He now believed that sugars, when taken into the empty stomach, acted as direct irritants of themselves and that they rapidly generated irritant organic acids. The obtunding of the appetite, the production of acids and gastric catarrh, were the most common immediate results. Sugar incapacity soon developed in certain older children as well as in infants, and as truly as fat incapacity developed from excessive fat feeding. Invert sugar and glucose were more injurious than cane, malt or milk sugar. Of this he had satisfied himself by repeated clinical trials. Cane sugar was partially inverted, or converted into glucose and levulose, by heating it with organic acids. Therefore, in apple sauce, fruit jellies, jams, preserves, rhubarb, etc., the sugar was partially inverted. Modern confectionery contained from 10 to 25 per cent. of glucose or corn sugar, made from starch by boiling with sulphuric acid. In lemonade and the various fruit syrups, the sugar was inverted to a variable degree. The symptoms of distress from sugar eating might begin within a half hour after eating it. These early symptoms were malaise, drowsiness and epigastric heaviness, and these could not be assigned to metabolic disturbances, but seemed to be due to the local effects of the sugar, either by direct irritation of the membrane, by its retarding effect on peptic digestion, or by the rapid formation of acids. Vomiting as a symptom, except in infants, was apt to occur from one to three hours after the meal.

Dr. Bartley believed that cane sugar, as well as invert sugar and glucose, when taken into the empty stomach in considerable doses, acted upon the mucous membrane as an irritant.

There were six ways in which excessive sugar ingestion could be harmful: (1) By direct local irritation of the gastric mucous membrane; (2) by the production of excess of acids; (3) by interfering with the digestion and absorption of fats, because of the excess of acids in the bowel and consequent malnutrition and anemia; (4) the disturbance of carbohydrate metabolism; (5) the production of a condition of acid intoxication, differing however from the better known acidosis of diabetes, cyclic vomiting, etc.; (6) by the remote effects on the nervous system and on the mucous membranes. If the result of the excessive indulgence in sweets were as injurious to a considerable number of children as he had claimed, they should call the attention of the public to it in such a way as to check it.

#### DISCUSSION.

DR. PHILLIP S. POTTER of Syracuse said that one writer had recently made the statement that the child should be given all the candy it wanted as this was a cry of nature. Such a statement was pernicious and harmful. Urticaria, rheumatism and respiratory affections in children might result from the ingestion of too much sugar. There were children who exhibited all the symptoms of tuberculosis but showed no physical signs and did not respond to the von Pirquet test, in whom cutting down the amount of sugar resulted in a clearing up of the symptoms. He cited such a case. In another case, extraordinary nervousness, bilious attacks, headaches and malaise were cured by cutting down the sugar. Some children could take from four to eight ounces of sugar daily and seemed to take care of it while there were many others who could not stand it.

DR. CHARLES HERMANN said they were indebted to Dr. Bartley for this paper. The degree of tolerance for sugar was a matter of individual idiosyncrasy. The cases showing the symptoms of tuberculosis were those known as "susceptible" cases and they easily fell a prey to that affection.

DR. GEORGE N. JACK of Buffalo said that these cases which were known as being susceptible to tuberculosis were hypersensitive, they had a high leukocytosis and a large amount of sugar increased this leukocytosis. The blood dumped the waste products in the line of least resistance, which was in the bronchi, larynx and follicular glands. Later the changes set up in these tissues spread along the trachea and bronchi and resulted in a general asthmatic attack.

DR. WILLIAM B. HANBIDGE of Ogdensburg related an instance where children in a home were fed by an ignorant nurse on sugar and water whenever they cried and there resulted a great deterioration in their health. Two children that he knew of had been raised without any sugar and they were fine healthy children.

DR. ELIAS H. BARTLEY said that in regard to the instance cited of the mother with a high percentage of sugar in her milk whose

children did well, it should be remembered that all children would not do so well as they reacted so differently to large amounts of sugar.

DR. HARRY RULISON of Albany read a paper entitled

#### SOME OBSERVATIONS ON INFANT FEEDING.

The normal child had a tolerance for a great variation in foods. Complicated formulæ were not necessary in the feeding of the normal healthy child. A knowledge of the nutritional requirements of the child to be fed and a correct interpretation of the various signs of nutritional disturbance, together with the ability to refer them to the particular element in the food that was causing the disturbance formed the basis of successful infant feeding. The failure to make a correct interpretation was the cause of failures in infant feeding. The food should be of the proper caloric value to meet the demands of the individual child and the various constituents, proteids, carbohydrates, and fats must be well balanced. It should not approximate breast milk or even resemble it. The method used should be flexible and easy of modification. The infant's food should contain milk, whole or skimmed, water, one to three carbohydrates and at least one form of sugar. Both the percentage and the caloric methods had their value but neither should be permitted to hamper one in the treatment of the individual case. The problem still remained as to whether it was better to feed according to age or according to weight. He was in favor of larger quantities at longer intervals. One feeding in four hours was frequent enough. In warm weather milk was found to remain in the stomach for five hours. There should be plenty of water between feedings. The early elimination if night feedings were desirable but not always possible. Formerly disturbances of the digestion in infants were attributed to the proteids but the consensus of opinion now seemed to be that they gave rise to little or no trouble, even if they formed 8 or 10 per cent. of the total amount of food. He usually began feeding from 1 1/2 to 2 per cent. proteids and increased the quantity to 3 or 4 per cent. by the end of the first year. Proteid resulted in no harm provided a certain amount of whey salts were present. He took issue with Cowie and Lyon on the statement that little or no proteid could be split up in the stomach on account of the normal absence of hydrochloric acid. He had found that the proteid in the stomach was completely dissolved during incubation when no hydrochloric acid was present; whether it was split into its ultimate amino-compounds he was unprepared to say. As to the fats it had been shown that they were split up by the pancreatic lipase to a greater extent than was formerly believed. Theoretically it seemed that fat digestion would not be difficult but in practice it was another story. Many could not metabolize even small quantities of fat. The average requirement was 2 per cent or less. Acidosis was obviated by the carbohydrates. Of these maltose was the most easily assimilable and least liable to fermentation. However, it had not given him any better results than cane sugar. The use of lactose

was based on theoretical considerations rather than on direct results. Starch digestion was not especially difficult in early infancy contrary to the former belief. An individual infant might develop an intolerance to a certain kind of sugar and when this occurred another variety should be tried. Many edemas were supposed to be dependent upon sodium chloride. Some occurred without renal or cardiac lesions and were dependent on faulty metabolism; a salt-free diet would sometimes clear them up over night. Proprietary foods had had more opprobrium meted out to them than was deserved but they should not be used hit or miss. The directions accompanying them should be disregarded. Whey feeding should be condemned in dyspepsia, acute intoxication, atrophy and spasmophilia. The administration of lime water as a routine measure was to be avoided as it delayed digestion.

DR. WILLIAM B. HANBIDGE of Ogdensburg read a paper on

#### INFANT FEEDING WITH UNDILUTED COW'S MILK.

He had been observing children that were fed on whole milk for twenty-one years. In 1910 he brought the subject before the St. Lawrence County Medical Society. In November, 1912, he read a paper at the District Branch of the New York Medical Society in which thirty-seven cases of whole milk feeding were analyzed, in thirty-four of which it was successful.

In this paper fifty additional cases are reported, fifteen in his own experience, the others by Doctors Elkins and Mason of Massena, Quain of Madrid, Cooper and Bryan of Ogdensburg. Many of them were fed from birth, some of them were sick children and almost every other method had been tried without success. A few cases seemed hopeless when they were put on the whole milk feeding. There were only seven failures out of the fifty and three of the seven could not take cow's milk in any form.

An analysis of many cases of vigorous infants fed on whole milk has brought some positive conclusions. Children on a concentrated food like whole milk should be fed only when hungry. If they are asleep don't arouse them. If they do get behind with nourishment they can easily make up lost time. It is nature's way to feed only when hungry. It is no doubt the craving of hunger that suggests feeding time to the young of the lower animals. If the digestion is good and appetite keen they look for food often, if not so, less frequently. In the human family, from the remotest time, no doubt children were fed when they cried, just as they are to-day by ignorant mothers. If they were sick they suffered from over-feeding; but if they were well, they were, as a rule, fed only when hungry.

In feeding experiments the important thing is to arrive at the truth, irrespective of theories. Perhaps we are too apt to think that a result cannot be accurate, unless we can give good reasons for its being so. John Hunter's plan of experimenting first and theorizing afterward, is the correct one with which to approach the subject under consideration.

Is it possible that in trying to get a food that chemically resembles mother's milk we have been led astray? The process of digestion is too complicated for chemistry to be the final judge. The stomach does not seem to occupy the dominant position in the digestive process that we thought it did some years ago. Of one thing we are certain, and that is, that food must not be retained for too long a time in the stomach. Large portions of the stomach have been removed and if a free opening be left between it and the intestines the digestion may not be impaired.

The muscles of the infant's stomach at birth are poorly developed and in giving a highly diluted food may we not be producing dilatation and atony of that organ and consequently interfering with the proper emptying of the stomach, which is essential to good digestion? May we not be diluting the gastric secretion so that the process of digestion will be slow? May not every cell of absorption and secretion be taxed to its fullest capacity; may not the bowels be distended and their muscles weakened, hence colic?

Experiments have convinced me, that from 1 1/2 to 2 or 2 1/4 ounces of whole milk for each pound that an infant weighs, contain enough nutriment, for each twenty-four hours.

One of our most popular works on pediatrics considers 32 ounces about the proper amount of modified milk for an infant eight weeks old weighing about 10 pounds, the same child on whole milk would require only from one-half to two-thirds that amount. If an infant weighing 10 pounds takes 32 ounces of liquid in twenty-four hours, an adult weighing 150 pounds, in order to consume an equal amount according to weight would take 480 ounces or almost a quart every hour he is awake, allowing eight hours for sleep. What would we say to a doctor who insisted on our taking so much liquid? Perhaps the infant when taking an equal amount of water in proportion to size, in the absence of speech expresses its feelings by crying. We must remember, however, that the child can take more liquid in proportion to its weight than an adult.

DR. DEWITT H. SHERMAN and DR. HARRY R. LOHNES of Buffalo presented

#### A PRACTICAL STUDY OF GOAT'S MILK IN INFANT FEEDING AS COMPARED TO COW'S MILK.

The babies were selected at random from the inmates of St. Mary's Infant Asylum and Maternity Hospital of Buffalo. The goat's milk averaged one-half to one and one-half richer in fats than the cow's milk used in this institution. All test meals were withdrawn one hour from the middle of the feeding and the amount recovered average in fourteen cases nearly twice as much of cow's milk formulæ as goat's milk, and this pointed to a slower digestion of the cow's milk. The curds of the goat's milk formulæ were smaller and more flocculent corresponding to the appearance in test-tube digestion. A table presented indicated the greater stimulating effect on the stomach of cow's milk, the greater stimulating effect of



both than of the proprietary foods made up without milk, and finally the greater stimulating effect of all three than of barley water. In some vomiting cases this table gave definite information as to the causal factor of the vomiting (*a*) through direct gastric stimulation, (*b*) because of the size and density of curds, and (*c*) because of slower digestion. As regards absorption and gain in weight their statistics were indefinite and for three reasons, viz.:

1. The babies being institution babies were apt to gain slowly.
2. Owing to an epidemic streptococcus infection which had swept through the infants' ward, causing gastrointestinal disturbances so serious that about one-fifth of all the babies died, the digestion of those who did recover was more or less impaired.
3. Because a certain number who were doing well were removed from the institution through adoption before their experiments were finished.

Of the number tested, sixteen cases in all, on similar formulæ, twelve gained more rapidly on cow's milk modifications, and four on goat's milk. The gain of the former group was in the ratio of 3 to 1. The gain in the latter group was in the ratio of 9 to 1. Consequently those who did gain on goat's milk gained more rapidly than on cow's milk, but fewer gained on goat's milk.

The taste of goat's milk which was so strong and so common in Switzerland was unnecessary and it was believed that the taste, as well as the odor, was due to a lack of udder cleanliness or possibly the type of food given the goat.

The more thorough emulsification of the fat in goat's milk, possibly the finer globules, prevented the separation of the cream upon standing, as occurred in cow's milk. This fact might be an element in reducing the tendency to regurgitation in goat's milk as compared to cow's milk, and further might be a very important factor in lessening the liability to sour vomiting due to fatty acid fermentation, so common in high fat mixtures. Further, because of the small size of the fat globules there was probably present in goat's milk a smaller amount of the lower or volatile acids, just as there was less of these volatile acids in cow's milk with small fat globules as compared with those with large fat globules, the latter giving the best cream.

The babies as a whole tolerated equally well similar amounts of goat's or cow's milk with the same diluents, but as the goat's milk contained higher fat than cow's milk, they actually received more fat per feeding and hence higher caloric value. It was consequently strange that more babies gained on cow's milk than on goat's milk modifications.

The stools on goat's milk were, as a rule, smaller and of a more vivid yellow color.

The age did not influence materially the ratio of gain on goat's versus cow's milk, but the younger the baby the more the evidence pointed toward a greater gain on goat's milk.

Their only conclusions that could be made were that in the child,

whose milk tolerance was below par, goat's milk agreed better because:

1. It was less stimulating to the gastric secretions.
2. It probably contained fewer of the lower or volatile acids.
3. Its smaller, more flocculent curds caused less local irritation.
4. It was somewhat easier absorbed by some children because of these lighter, more flocculent curds.

DR. GODFREY R. PISEK of New York considered

#### INFANT FEEDING FROM A NEW STANDPOINT.

The history of infant feeding embraced many methods which had succeeded one another in popularity. When but one method was in vogue it was not so difficult to follow it but when all methods were in fashion at the same time the situation became complicated. Raw milk, diluted whole milk, the percentage method, the caloric method, milk pasteurized to eliminate bacteria and milk to which millions of bacteria had been added to aid digestion, proprietary foods denounced by those who used them, teachers preaching one thing and practising another, what wonder that with all these the people were bewildered and the general practitioner was in a hopeless predicament. Scientific infant feeding was bound to fall into disrepute unless pediatricians restored harmony and consistency to their own ranks. Unless they got together and agreed upon fundamentals they must not be surprised to see the manufacturers of proprietary foods swamping the market with literature which would be convincing to the lay mind confused as it was by divers opinions. A case had recently been reported to the writer of a physician who had the care of an infant whose nutrition was not progressing satisfactorily. The mother wanted to feed the infant condensed milk but the physician who had been taught that the condensed milk did harm had objected and quoted the author of his text-book to that effect. The mother asked for a consultation with the author of that book, and, to the chagrin of the attending physician, that authority prescribed condensed milk. This was only one of many instances. Students going from one clinic to another heard their teachers make contradictory statements and the question arose "How was the general practitioner to know what to do when authorities flatly contradicted one another in what were supposed to be the fundamentals?"

Scientific infant feeding consisted in doing what was right at the time, for the particular infant. It was impossible to state in a book what was to be done under all conditions. Each procedure had its place and in its place was scientific feeding. Out of its place it was unscientific. A statement made years ago might have been correct at that time and yet be incorrect to-day. The average student in an agricultural college or a domestic science school had a better knowledge of the fundamentals of nutrition than the average medical practitioner.

Fundamentals of physics, chemistry, bacteriology, and surgery were uniformly taught. In infant feeding it was different.

They must approach infant feeding from a new standpoint and they would do this when they concentrated their teaching on the broad general principles of the science of nutrition of which infant feeding was only a branch.

#### DISCUSSION.

DR. CHARLES R. WITHERSPOON of Rochester said that anyone who practised general medicine when he had once had two babies under his care knew that he could not feed them both alike. In feeding an infant one should have a good reason for what he did. It was important to know the number of calories one was giving but one should not depend entirely upon that; one should know the percentage of the different constituents of the food, but one should know more. He must know about stools, must know how a healthy baby looks, and what he feels like.

DR. J. ROBERTS JOHNSON of Syracuse said that it must occur to some of them from the papers that they were still far from having definite and settled convictions. Unless they came together and agreed on fundamentals they would become the laughing stock of the laymen. They should have a knowledge of the general requirements of the infant and then study the individual case. They should educate the mothers as to what clean milk was and show them how to use it and teach them to hold proprietary foods in abeyance. These had their place but should be under the control of the physician. As to the whole milk feeding, he wondered if the milk near Ogdensburg was different from that in other localities. His results were very creditable and spoke well for the individual care given the babies. In his experience he had had the greatest trouble with excess of fat. The malt sugar was easier cared for by the economy than any other variety of sugar. Goat's milk was not as practical as other methods as it could not be obtained in all localities.

DR. GEORGE VAN GAASBECK of Kingston related an instance of one mother who fed nine babies at irregular intervals and all were robust and healthy.

DR. L. A. LAFETRA said that the subject of infant feeding was a most important one as it was the distinguishing mark of the pediatrician. As Dr. Pisek had said there was much confusion as to the exact method to be used in a particular case. In fact infant feeding was easy only on paper. Babies had thrived on every imaginable manner of feeding, but this proved nothing. The healthy baby was very resistant. The cases that they were interested in were the cases of difficult feeding, and these were the cases that taught them something. In these difficult cases one must try to select that particular form of food that one thought would suit that baby. If the method did not succeed then one should find out the cause of failure in that case. Infant feeding offered many problems. Take for instance twins weighing the same at birth, looking exactly alike, nursed by the same mother, one would thrive and the other would go on to marasmus. How could one ac-

count for this? Even if a child was not being fed in just the way one might think it should be, if it was doing well let it alone.

The papers of the morning had been exceptionally good. Dr. Rulison's paper was a splendid epitome of the present status of infant feeding. He had spoken, however, of the caloric method versus the percentage method. This was a mistake for there was no antagonism between the methods. The caloric method was valuable as a check and the two methods should be combined. The percentage method was valuable in showing what quantities of the different food elements the infant was getting. As some one said "A lump of coal had lots of calories but you could not feed a baby on it."

Individual babies differed in their capacities for sugars. They had to find out which one was suitable in each case.

As to the salts, Dr. LeFetra did not think they knew much about their action; they were taking exceptional cases. Theoretically an edematous waterlogged baby ought to have no salts; yet they gave skimmed milk and the edema disappeared. What about the theory? Some babies could stand beer. What about the theory? As to the whole milk feeding, one might take a baby that when it took an ordinary quantity of mother's milk, vomited it and put that baby on concentrated food giving it sufficient calories and the baby would do well. The healthy breast fed baby of 8 pounds took 24 ounces of milk from the mother in twenty-four hours, that was about 3 ounces per 1 pound weight. About one-fifth the body weight was a good rule. One badly nourished baby was cited as getting double the quantity of food supposed to be required but the fact that the baby was badly nourished showed that it needed the excess. Having sufficient calories, sufficient liquid and a proper balance of the principal food elements one was on the right road to the correct food.

The statement that proprietary foods had no food value was not true. These preparations did have a food value and often could be made good use of. In their infant feeding at Bellevue they used a wide diversity of foods, top milk, skimmed milk, whey, albumin milk, condensed milk, dried milk, and all forms of sugar and there was a place for each.

DR. GEORGE DOW SCOTT of New York had never been able to get results or even understand percentage feeding or the absolute use of caloric feeding, believing the latter impracticable. A certain amount of proteid, fats, and carbohydrates with a digestant in a test-tube does not mean that the same condition takes place in the stomach and intestines. He used cream, skim milk and boiled water as diluents with cane sugar up to four to five months, then whole milk with cereals, gradually reducing the water and adding more cereal solutions. He strongly advocated the giving of pineapple and of orange juices together with the cooked fruit juices for the relief of constipation and for their tonic effects.

The scientist and the clinician should go hand in hand as both

working together were essential for good results. The modern pediatricist should have sound common sense.

DR. T. WOOD CLARK of Utica said that Dr. Sherman had done good work and that if more men had the patience to carry out work of this kind they would get results that would teach them some things. Hydrochloric acid had a great deal to do with the formation of the curd. They must have curds, that was nature's way of digesting the milk but they did not want a tough curd. Lime water instead of decreasing the hydrochloric acid really increased it and was absolutely contraindicated. Sodium citrate, however, acted entirely differently. The total acidity was slightly lowered and there was a tremendous increase in the acid salts; there was no free hydrochloric acid, only a little in combination, and no curd. A sodium chloride and citric acid was formed which was not so active in forming the curd. His advice was, therefore, to citrate the milk. In the analysis of stomach contents he had found hyperacidity and anacidity. A good test meal was of value and it was not at all difficult to remove such a meal from the infant's stomach. They should study the chemistry of the child's stomach; this was a matter that was being grossly neglected.

DR. HARRY RULISON of Albany said that in relation to the fermentation of lactose and maltose, he did not mean that lactose was more fermentable than maltose. Lactose seemed more influential in producing diarrhea than maltose. He had stated his disapproval of lime water as a routine measure. It had been used for three reasons: first, because it was supposed that human milk was alkaline and cow's milk acid; it had been shown that at times human milk was acid; secondly, it had been given to facilitate casein digestion and to prevent curdling although this was a natural process; third, for its effect on acidity; this resulted in delaying the passage of the stomach contents which was not a desirable effect.

DR. HANBIDGE said that he had been very conservative in his attitude toward whole milk feeding. One of the greatest mistakes in infant feeding was that of giving too much water. He had tried all phases of infant feeding but had learned a great deal from ignorant mothers. It seemed extraordinary that babies thrived on the foods sometimes given them. So long as the baby was doing well it was best to leave it alone. A good plan was to experiment first and to theorize afterward.

DR. SHERMAN said that in dealing with an irritable stomach they should bear in mind what would and what would not stimulate it.

DR. PISEK said that Dr. Rulison showed the tendency of the German school and he thought that if he would take the good that he could find in the German methods and apply them in connection with our methods he would be more successful. In regard to the longer intervals between feedings, he said the child's stomach had a tendency to empty rapidly; it might empty itself entirely in thirty-five minutes. He had offered food to an infant whose stomach had emptied itself in this short time and the child took it and wanted

it, or it could not have taken it. There was no question but that some babies did well on exceptional types of food.

DR. WITHERSPOON spoke of the difficulties that confronted the general practitioner when it came to the subject of infant feeding and said he sympathized with him. When a pediatrician was called in the family had confidence in him and were willing to wait to see results, but this was not true in the case of the general practitioner and the only thing he could do was to endeavor to win the same confidence that was bestowed on the specialist by informing himself more thoroughly on the subject of infant feeding.

DR. HANBIDGE had been asked what kind of cows were used to supply the whole milk; he could not tell as all kinds had furnished the supplies.

DR. RULISON in reply to the question as to what kind of test meals were employed, said that they had used various kinds, matzoon, farina with bismuth and all kinds of liquid foods.

DR. IRVING M. SNOW of Buffalo presented a communication on

#### THE X-RAY AS A MEANS OF DIAGNOSIS IN INTUSSUSCEPTION.

##### DISCUSSION.

DR. LEON T. LEWALD of New York said that while on one hand they were met with the statement that a certain thing was impossible of accomplishment, on the other hand they had met with one who had actually accomplished the impossible. Dr. Snow had demonstrated the possibility of the diagnosis of intussusception by means of the Röntgen rays.

No child was too young nor any adult too old to prevent an x-ray examination being made without danger to the individual. The obstacles were more difficult for the röntgenologist, but with the present instantaneous methods of exposure they were not insurmountable. The application of well-known methods used in examination of adults could and should be used in the examination of infants.

Dr. LeWald said he would urge the more frequent use of the x-rays in the examination of infants. Dr. Pisek had taken up this work in connection with the examination of the stomach of infants and Dr. Snow's work should stimulate them all to the systematic examination of the infant's intestinal tract by means of the x-rays.

#### THE PHYSICIAN AND THE MENTALLY DEFECTIVE CHILD.

DR. ISABELLE T. SMART of New York said that this problem was demanding the earnest consideration of the State legislators, sociologists, and educators, but up to a very recent time the physician had been content to allow the laymen to enter this field of pediatrics and to control practically all that had been or was being done for this type of children. It was being contended that physicians did not know how to diagnose these cases. This was a grave



accusation and reflected in a very uncomfortable manner on the acumen of medical men and women.

The group of children which Dr. Smart said she wished to consider on this occasion was not that of the markedly defective but that group of children which was more or less of a puzzle. This class embraced the unusual child, perhaps the nervous child. The general practitioner was apt to pass over this class of children lightly. He often did irreparable harm by telling the parents to wait until the child was seven, or fourteen, or twenty-one years of age. A strong plea should be entered for the most careful and painstaking examination and study of every unusual child presented to any physician. These children too often received no attention unless they were cases suitable for an institution. The physician did not recognize the serious possibilities which these children presented, and did not study or attempt to find out about them. It was true that some of these children seemed to defy the methods and means at hand for classifying them as to their mental status. These were in a large measure the border-line cases. The outcome in many of these cases depended upon proper nourishment and correction of physical defects, for a vast number of these cases of mental abnormality were dependent upon bodily defects. When the physical condition was improved they were often able to take their places and hold their own in fair and open competition with their fellows.

Several investigators from the Vineland Laboratory obtained permission to examine emigrants arriving at Ellis Island. There were forty-four cases tested, of whom thirty-three were selected by the regular medical inspector of the department as probably mentally deficient. Of these thirty-three fifteen proved to be mentally defective while eighteen were normal. Less than one-half had been correctly selected by the medical inspector while seven-eighths were correctly chosen by the experts. There should be a thorough and exhaustive examination by a scientific trained physician in all these cases, by one who could get at causes and pathological conditions as well as the defects themselves. Yet the lay worker constantly scored the physician. It was time for all physicians whose work was primarily with children to be up and doing to be able to meet the snap-shot diagnoses of the untrained or partially trained so-called expert.

Every physician who had been in practice probably met a number of these backward children. Instead of being lightly passed over they should be closely watched during all of their formative years; nervous manifestations should be noted; school progress and mental acumen measured; eyes, ears, throat secretions, heart, liver, lungs, all should come in for a share of attention. Special attention should be directed to hypersecretion and under secretion, particularly with reference to the pituitary gland about which they knew less than of the other glands, thyroid, etc. The physician could not afford to be behind the times in this matter, but should keep abreast of the big social problems. They should remember that the unfit

multiplied six times as fast as those of a higher order. It behooved them to make themselves wiser so that they could make an intelligent protest against laws that endangered this class and also normal children for the normal child might later marry the unfit and so widen *ad infinitum* the vicious circle.

Dr. Smart referred to the short-sighted attitude taken by the State with reference to the request of the Commission of the Board of Charities for an appropriation for enlarging the scope of work at Letchworth village. It would be economy in the long run to provide State supervision for the defective child.

#### DISCUSSION.

DR. MARY SUTTON MACY of New York said that in her paper Dr. Smart had alluded to the necessity of careful examination of all unusual children with a view to proper classification and probable treatment of such as were in a slighter or greater degree mentally defective and she called particular attention to the child showing retarded development from infancy. This was a highly important point to bring to the attention of the pediatrician but she had not emphasized it sufficiently. The consequences of retarded development or of even a temporary arrest of development in some slight particular were all too little appreciated by physicians as a whole, whether they were specialists or general practitioners.

Within the past few years Dr. Macy said she had been impressed with the lack of scientific data on the normal development of the child after the age of three years and especially so with the apparent tendency to neglect all differentiation between the degrees of development of organs and functions in the child after six years of age and in those of the adult. If they were ignorant of the relative degree of maturity in various functions and organic systems for the normal child, they could not expect to advance much with the abnormal, the retarded or the arrested forms of development which appeared in the mentally defective. Dr. Macy said she and Dr. Smart had collected data in the course of a routine examination of 6,246 school children in the public elementary schools of New York City. The examinations were in three series. All these cases were sent up by the schools on the presumption that they were mentally deficient. This presumption was variously arrived at by the pedagogical authorities presenting the cases; some children were sent because of their inability to advance in the grades without repeating each term; some for nothing more than a reputation for excessive "badness" or for chronic truancy; but some gave physical and mental evidence of low-grade imbecility or idiocy so as to be unmistakable even to the least informed, average-minded layman. Of all the cases in the three series 13 per cent. were truly institutional cases of mongolianism, imbecility or idiocy; 51.8 per cent. were found to be in need of some very specialized form of pedagogical training in order to develop their mentality to the greatest extent. The large percentage of sensorial defects as well as general nutritional and neurotic dis-

orders might have some relation to the degree of mental inadequacy since the proportions in all these conditions were so universally larger among those requiring the special training of the ungraded classes. Of those examined 88.6 per cent. showed eye defects; 67.7 per cent. ear diseases; 70.3 per cent. defective teeth; 33.2 per cent. enlarged tonsils; 32.3 per cent. enlarged adenoids; 46.5 per cent. both tonsils and adenoids enlarged; 53.2 per cent. speech defects; 6.4 per cent. epilepsy; 5.8 per cent. chorea; 37.3 per cent. other neuroses; 8.2 per cent. were tubercular suspects; 17.5 per cent. showed cardiac weakness; 68.7 per cent. showed nutritional disorders. Dr. Macy also gave statistics from 10,000 cases showing relative physical defects which she had presented at the International Congress on Hygiene and Demography. These statistics gave some idea of the immensity of the problem with which they had to cope. In a series of 125 cases which at the first examination showed more or less definite signs of mental deficiency including from two to four retardation, the children were all classed as feeble minded and recommended for special pedagogical treatment, as well as mental and hygienic care. Without exception these 125 patients, following upon proper medical and hygienic care, and having the advantage of specialized pedagogical care during periods of from two to four years, had so far recovered from their feeble mindedness that they had been able to resume and maintain their places in classes of children of their own age. This series of cases emphasized the following points: 1. Originally and despite close observation and study, these cases were diagnosed as feeble minded by medical, pedagogical, and psychological experts alike. 2. To-day such a diagnosis would not be made. 3. Not institutional, but school, medical and hygienic care had accomplished the transformation.

DR. PISEK said that Dr. Smart had not overdrawn her statements. In New York City schools and clinics these cases presented themselves in large numbers and they certainly made an appeal to one's sympathies. Some change in regard to their care was bound to be made within a few years which would put them into proper hands. There were not enough medical men who could handle them at present. The study and recognition of these cases really made a specialty within a specialty. There were in New York City cases of well-marked cretinism at eleven and twelve years of age who had never received any treatment. There was one group of defectives which was sent by the schools for examination and classification. Even if they recognized these cases how were they to help them, There was needed a fully equipped department with a hospital connected with it. They should have corrective appliances for the physical defects, a room for physical therapy, facilities for the treatment of eye and ear defects, etc. When the general practitioner got these cases he usually sent them for adenoid or tonsil operations and of course they were but little benefited. Simple but efficient measures were needed in order to put these children in their proper places in the world. As to Letchworth Village, this was an economic question. If the State could be made to understand the drain that

such a defective child was upon the family income and the time of the mother, and later the burden upon society, the legislators might see that it was economy for the State to endeavor to train these children or to care for them. As to the lack of data regarding children from the age of two to six years this was not altogether the fault of the physician; the child was lost to him at that age. Possibly the prize baby contests that were being instituted all over the country might bring this type of child to the attention of the physician at an early age. These contests at least offered a field for the pediatrician to get into touch with large numbers of children.

DR. IRA S. WILE of New York said that Dr. Smart had been extraordinarily conservative in her statements. It was said that there were 3,000,000 defective children in the United States; that 4 per cent. of the school children of the country were defective to the extent of requiring institutional care. It was said that there were in the State of New York 12,300 children who should have institutional care. There were certain types of abnormal children, the plain defective, the defective complicated by deafness or blindness and the borderline cases. There was at present a bill before the legislature asking for a commission to examine all the children coming into the criminal courts in order to ascertain to what extent this class of individuals were defective and with the object of providing proper custodial care for them. It had been said that physicians knew but little about these cases and it was far from his purpose to contradict that statement, but there was a reason for this lack of knowledge. The pedagogue was interested in advancing his pupils and he was in a position to make comparisons which it was not so easy for the physician to find the opportunity of making. Often the condition of the borderline cases was due to faulty conditions at home, sometimes his mental state was due to insufficient nourishment or it might be due to eye or speech defects. These children might be backward but not feeble minded. Eile cited the case of one child who was regarded as feeble minded because of a speech defect. The public schools acted as a clearing case for the feeble minded. It was not so easy to recognize the borderline cases, and the older practitioners had not had the opportunity of studying this problem. The problem was not only to recognize such children but to know what to do with them. There was no institution that was not already crowded. Again such children could not be detained without the consent of the parents. The Vineland Laboratory was creating a false impression by giving the idea that all persons were defective simply because one could not do a certain thing as well as someone else. The eugenic phase of the question needed attention.

DR. IRA S. WILL of New York presented a paper on

#### SOCIAL PEDIATRICS.

In a few medical schools there were given didactic lectures in pediatrics without clinics, while in other types of schools there was a variable number of clinics without any lectures. While pediatrics

is an offshoot of general medicine, it presents many problems that are not generally included in internal medicine.

Medical schools existed for the purpose of supplying the community with men who were trained in caring for the public health. If the schools failed to teach their students the methods of preservation of life, they fell short of their ideal purpose. At the present time there was one physician to every 113 families in the United States. The position of the physician was altering in that the community no longer regards him merely as an individual, capable of curing individual diseases but as a specially gifted man, capable of guiding the public in and to health.

The problems of the infancy and childhood should not be given subordinate positions in the medical curricula when they occupied a most prominent place in the category of medical problems. One out of every five in the population according to the census was a child whose welfare might be considered as belonging to the department of pediatrics. This mortality rate indicates that approximately one out of every three deaths within the registration area falls upon a child under fourteen years of age. Practically one-fourth of the total mortality in the registration area occurs under the age of 2.68 years. These figures serve to indicate the immense importance of the field to be covered by pediatrics. Such facts should accentuate the responsibility of medical colleges for paying attention to instruction in pediatrics.

Medical efficiency might be viewed from the standpoint of cure and to this extent the grade of efficiency reached depended largely upon the intelligence and capabilities of individual physicians. The second phase of efficiency viewed the subject from the point of preventive medicine and constituted a social problem. There was a mixed type wherein cure and prevention were closely bound together as would be evidenced in the use of antitoxin for both the cure and prevention of diphtheria. The widespread prevention of disease depended upon the profession as a whole.

Recognizing the social and economic forces which interfere with medical progress, it was important to train our medical students so that they might appreciate the difficulties with which they would have to contend. It was impossible to give a complete course in sociology to medical students with the present distribution of the time; but a physician with a knowledge of sociology was far better prepared to cope with the social problems in the manner that the future generation would demand.

Physicians were urging more careful instruction in practical hygiene in our elementary schools and yet the practical social aspects of hygiene, particularly as related to child welfare, were neglected in the great majority of medical colleges in the United States.

The teaching of pediatrics must be strengthened. Medical colleges should have specially trained teachers for this subject because of its immense value to humanity.

The value of midwives, the importance of health registration, the value of milk depots and infant consultations are certainly pedi-

atric themes. The relation of day nurseries, boarding-out systems, convalescent homes and babies' hospitals were intimately bound up in the mortality rate. The value of school nurses, medical inspectors, school clinics, child labor laws and district nursing were not foreign material in a broad visioned course on pediatrics. The necessity of open-air schools, the problems of prevention of blindness, the detection and care of defectives, form topics in a social pediatrics which are at present holding the attention of welfare workers, while the physicians were not fully acquainted with their relation to pediatric medicine.

Students were not always made to appreciate the full social or hygienic value of breast milk; nor were they given the necessary information as to the conditions, physical or social, which made it necessary to remove the children from the breast.

The fundamental causes of infant mortality were poverty and ignorance. The physician might not be able to relieve poverty but he should be able to correct ignorance and discipline its stepchild, neglect. The pediatricist, teaching methods of prevention, must take into consideration the underlying social condition or his teaching must be inadequate. Pediatric medicine should be taught in its relation to community life. This was the only way in which the preventive phases could be presented to students in their true relative importance.

Eighty-five per cent. of infant mortality occurred among children receiving artificial foods. The problem of municipal milk supplies and milk sanitation involved some fundamental social concepts that might well be applied to pediatrics.

To adequately teach the conservation and protection of infancy and childhood, medical schools must be socialized in spirit. The pediatric departments, particularly, must participate in this new awakening because the problem of lessening one-third of the total mortality comes within the scope of pediatric work.

The students were entitled to receive lectures upon social questions as related to the causes of infantile diseases and they should be given some training in the value of the various types of institutions that existed for the prevention, control, and relief of disease.

If pediatricists were to be leaders in the preventive medical work that was now the present ideal in medicine, the pediatric teachers must be aroused to their responsibility. Social pediatrics must be taught, and when this time comes, the graduates of our medical school would receive from the pediatric departments the training which indicated an understanding of the problems of humanity. The graduates would thus go out into the world in possession of knowledge, confidence and ambition, born of a consciousness that "none of us liveth to himself and no man dieth to himself."

DR. PHILIP VAN INGEN of New York presented a paper on

#### SOME NEGLECTED ASPECTS OF THE PROBLEM OF INFANT MORTALITY.

He declared that in spite of all the attention that had been directed to this subject the facts in relation to infant mortality needed con-



stant reiteration. The deaths from diarrheal disease were from 20 to 30 per cent. of the total infant mortality, being obvious as to the causation. Infant welfare stations, prophylactic dispensaries, and milk stations had accomplished much. Especially was this true where education of the mother was added. Such instruction was now given all the year around instead of just in the summer months as formerly.

A large proportion of the infant mortality, varying from 25 to 40 per cent. was attributed to congenital debility, prematurity, etc. Thus far there had been no decrease in the percentage of deaths due to these causes. From the vital statistics in the Borough of Manhattan during the past seven years there had been a slight decrease in the number of deaths of infants under one month of age but none among those under one week. It was generally admitted that mortality occurring during the first week or first month was largely due to conditions acting upon the child through the mother before its birth. The distribution throughout the year of deaths of infants under one week old was almost uniform. The average for 1906 to 1910 showed the percentage for single months varied from 7.44 to 9.63 with July and August showing, 8.57 and 8.09 per cent. of the year's mortality respectively. A greater portion of deaths of this class occurred during December, January, February and March. Little had been done to prevent this group of deaths. Dr. Hermann Schwartz of New York had carried on an educational work among mothers since 1908. In Boston the Woman's Municipal League had carried on a campaign of education for expectant mothers. In Dr. Schwartz's work the mothers had been confined by a physician or in a hospital. The work carried on by the New York Milk Commission since 1911 was slightly different. Among the foreign mothers it was difficult to get them to employ any one but a midwife in their confinements and it had been their policy when this was demanded to recommend the most reliable midwives that they could. They sent nurses to the homes of expectant mothers who visited them as friends at intervals of ten or twelve days and gave practical instruction applicable to each case. They had directed their efforts to securing for the women relief from hard work during the latter months of pregnancy and where it was necessary they had obtained financial help through cooperative relief agencies. The visits of the nurse were omitted while the mother was under the care of the midwife or physician but as soon as the visits of physician or midwife ceased the nurse resumed her visits and made them more frequently than before the birth of the child. Accurate records of the cases were kept. The success of the work was judged by the still birth rate, the premature birth rate, deaths under one month and the proportion of maternal nursing. Up to December 31, 1912, they had supervised 1,375 women. They had had two deaths, one from toxemia of pregnancy and one from hemorrhage following placenta previa. In other words 95.3 per cent. had given birth to living babies, 1.2 per cent. to premature living babies and 3.5 per cent. to still-born infants.

At the end of a month 97.3 per cent. of the babies were living, 2.7 had died. This was a death rate of 27.5 per 1,000 living births as against 40.2 per 1,000 living births in the Borough as a whole. The still birth rate was 34.3 per 1,000 living births as again 47.9 for the Borough as a whole. Furthermore these cases were among the poorest classes in the worst living conditions and every still birth was included no matter when it occurred. Of the living babies 93.2 per cent. nursed entirely; 4.1 per cent. partially, and only 3.7 per cent. were fed artificially. There were forty-four twins so that only 2.77 per cent. of the mothers did not nurse their infants at the end of a month. Future reduction in infant mortality must be along these lines. Sir George Newman had said "The problem of infant mortality is not one of sanitation or of housing, or indeed of poverty as such; but is mainly a question of motherhood. In the consideration of any measure for the reduction of mortality, we must first attempt to solve the problem through the mother."

#### DISCUSSION.

DR. LAFETRA was glad to have heard two such excellent papers but the ground covered was too great to discuss adequately in the brief period allotted. Those working on the problems involved had come to the conclusion that they were largely attributable to three factors: 1. The family income which involved the efficiency of the head of the house, and this problem must go back to the elementary school. The boy should be trained to be capable and efficient and to take his proper place in the world. 2. The girls must be trained in the making of a home and in child hygiene. This was a problem which must be faced and taken up so that girls might be trained to fill the sphere which they would be called upon to fill. Not all girls who went to college became college professors; the large majority were likely to marry, and should be trained for their work. 3. They had the problem of eugenics and all that it implied. The instruction in the medical schools should be broadened out but the question was how to make this practicable. Of course the pediatrician should be a leader and teacher and must have knowledge both theoretical and practical. There were three ways in which this could be accomplished: 1. These practical sociological problems could be presented in two or three lectures in such a way as to fasten the attention of the student upon them. 2. The students in the out-patient department could be made to visit the homes of the patients and they could thus learn at an earlier time than they ordinarily did the exact condition with which they would have to cope. They formerly learned this during their ambulance service or in the care of maternity cases. 3. When the student occupied the place of medical clerk in a hospital, conditions in the homes might be brought to his attention by having him copy the reports of the visiting nurses and by going to the homes and seeing the conditions for himself.

At Bellevue Hospital they had a sheet of social history which told of the housing conditions; the history of the father, nationality,

income, occupation, habits, etc.; family conditions, whether father and mother were living together or separated, etc.; whether there was any insanity in the family; whether the parents spoke English; how the children were cared for, whether by the mother or a brother or sister; what the sleeping conditions were; with regard to the feeding, whether it was artificial or breast feeding, and whether the family had ice or not, as well as how the milk was prepared. They were also asked with regard to outings, for it was often impossible for the child to be taken out. Such facts if studied by the clerk would emphasize the importance of social conditions. The points that Dr. Wile made were also important.

As to prenatal care, there was no doubt but that such instruction in hygiene and eugenics would lower the infant mortality.

DR. PISEK of New York said that Dr. Wile had covered the subject very thoroughly. He had pointed out the deficiencies in the medical colleges, but just as they were beginning to get enough hours instruction in pediatrics he wanted more which could be devoted to communal interests rather than to the individual.

If this could be done and the physician properly trained in this broad way he could be prepared to displace those now in charge of institutions for children who had no interests in the broad sense. Then the physician would indeed be a doctor of public health. Part of the work of the doctor of public health had better be taken up by the pediatricist. It was often said that the smaller cities did not have these social problems but there were few cities of 30,000 population that did not have their slums and often they were worse than those in New York and less was being done to ameliorate the conditions. Dr. Van Ingen had taken up the second problem of infant mortality, those of prenatal education, caring for the child before birth. If this work was continued they would have thirty-three births added to every one thousand registered and this represented but a small amount of work and was not expensive.

DR. GEORGE DOW SCOTT believed that cities towns, villages and small communities should be divided into sections over which presided a physician to instruct mothers of the poor in baby hygiene and feeding. Over this man stands another physician as head of a number of sections and still over the latter should be a head physician, the central station, perhaps at Washington, controlling the entire country.

DR. JOSEPH ROBY of Rochester wished to sound a conservative note. The only disease really controlled was smallpox; the children's diseases were not controlled and he doubted if isolation would control them, though they seemed to be developing an immunity for them. It had been found in an investigation in Chicago that the death rate was higher where there were four or more children in a family than where there were less than four. The problem of problems was overpopulation and the millenium would never come without giving it due consideration and anyone who believed it could was reckoning without his host.

## NERVES AND THE NURSING MOTHER.

DR. CONWAY A. FROST said that he might be thought to be dealing with a trifle but trifles sometimes had far reaching consequences. The influence of the nervous system on the milk of nursing mothers had a further reach than was at first realized. The fact that mother's milk was the only perfect food for the infant was often forgotten. Were the same time and energy expended upon finding what element was the cause of the mother's upset and what could be done to remedy it, that was put upon cow's milk adaptation, something of importance might be forthcoming. The average physician if called to attend some infant with digestive trouble, if he did not immediately straighten things out, turned to his favorite text-book and skipped the part that was devoted to rectifying the trouble with mother's milk, and read up on milk formulæ, and the long struggle began. Even in a short paper it was hard to hold the attention of those present from escaping to the cow and the favorite modification of cow's milk. If, for some unknown reason, the mother's milk had disagreed with the child, the physician only inquired what the mother had eaten and if the inquiry brought nothing to light he failed to look further. He believed that they were often on the wrong track, that the trouble was more often due to a break in the equilibrium of the nervous system than to some pernicious food taken. The mother nursing her child was generally fairly careful of her diet but she allowed herself to be exposed to all sorts of major and minor shocks to her nervous system. The shepherd who cared for his flock guarded the ewes from fright because it affected the young lambs. The farmer's boy was careful in driving the cow home not to irritate her for fear of spoiling the milk. Yet how little care was taken of the nursing mother in this respect. He thoroughly believed that a life devoid of nervous shocks was of far greater importance for the well being of the nursing mother than a diet devoid of minor indiscretions. Just how these nerve shocks interfered with the proper secretion of the proper food they did not know. Metabolism they knew was often inhibited, the whole digestive process upset and the sweat glands inhibited or stimulated by emotion and yet they utterly ignored the emotional effect on the sensitive milk glands of the breast. It had been his experience that proteids had been increased during such nerve upsets, and so, not because he considered this the only change, but the most palpable one, in his present state of knowledge, it had been his custom when this could be proven to increase the number of bottle feedings temporarily (if the child had been fed on mixed feedings) and also to try to get a higher fat and lower proteids in the milk of the mother. This of course dealt with only one phase of the trouble. The difficulty probably at times originated from an increase in fats. If these changes were found why not others, the salts, for instance, the numerous enzymes and alexins which were derivatives of the cells. They should endeavor to obtain further light on these upsets. This paper was written rather as an appeal for light on

this subject than as an investigation. He wished to emphasize the fact that these upsets occurred oftener after a nervous shock than after an indiscretion of diet. The digestive apparatus was capable of taking care of the ordinary and at times the extraordinary diet, but no digestive apparatus could stand the strain of worry.

#### DISCUSSION.

DR. FLORENCE STAUNTON of Utica said that between the two stools of the obstetrician and the pediatrician the average infant spent the most of its time on the ground. Some facts were difficult to account for; some neurasthenic mothers were good nurses while some phlegmatic women could not nurse their children at all. In reference to the care of the pregnant woman, Dr. Staunton said she wished to urge that this care be begun early; they should be accustomed to thinking of nursing their babies. Pregnancy and nursing were subjects upon which women did not think enough. Another point she wished to make was that the pregnant woman should have a thorough examination. It was not sufficient that albumin was not found in the urine. Nervous troubles and eye strain should receive attention. If there was some change in the matter of fees it might be that the physician would see the pregnant woman earlier and oftener. Under the present system of charging for each professional call the woman of the middle classes hesitates at the expense. It would be advisable to charge a definite sum for care during pregnancy and delivery. Another point was that more patience should be exercised in starting the milk supply. Frequently inability to nurse a child was the result of nervous fear on the part of the mother lest she should be unable to perform that function. A great deal could be done in such cases by restoring the confidence of the mother. If one would work at the milk supply for four, five or six weeks success might be obtained in cases in which it had seemed impossible. Mothers should not nurse their babies longer than the tenth or twelfth month. They frequently nursed them and fed them at the table at the same time. The long nursing unfitted the mother for a succeeding pregnancy and lactation.

DR. CORNELIA W. THOMAS of Rochester said that the problem of nerves in the nursing mother was not different from the problem of nerves in any other mother. An unbalanced nervous system meant mental irritability. The baby was influenced by the nervous condition of the mother before the child was born as well as after. The cause might be anemia, any of the various pelvic affections, or a nephroptosis. For all of these conditions the physician could do something but she did not know what could be done for the hard working woman who was the mother of a large family dependent upon her for support. They would have to leave her to the social worker.

DR. T. WOOD CLARK of Utica was glad they had gone back to the woman. However much they might disagree on the subject of artificial feeding they all agreed on the breast for one year for

the baby. The question was how to succeed in giving the baby its proper nourishment. The number of mothers who could not nurse their babies was insignificant if one attacked the problem in the right way. It seemed that the greatest cause for worry was worry because she thought that she could not nurse the baby! She should be made to believe that she could nurse her baby and she would be able to do so. Dr. Clark cited the case of a very delicate woman who had worried a great deal over her first child that had optic atrophy and who was afraid the second would have the same affliction, she was also afraid that she could not nurse her baby. When the time arrived she had twins and was very sure that she could not nurse them. She was persuaded to make the attempt. She nursed both babies until they were seven months of age and gained fifteen pounds during that period.

DR. IRA S. WILE of New York City called attention to the mistake that was often made of thinking the mother could not nurse her child because she had no milk on the second or third day. A number of instances had come under his observation where the flow of milk had been established at the end of three months after delivery. The best stimulus was the suction of the baby. When the mother went to the milk station under the impression that she could not nurse her baby those in control of the station should see that she first made an effort to nurse the baby before resorting to artificial feeding.

DR. MARY SUTTON MACY said that no one had called attention to the mothers who were nervous because there were not hours enough to play bridge before and after confinement.

DR. ELIZA M. MOSHER of Brooklyn said that there was one point that had not been brought out and that was that there were many women with inverted nipples. These gave a great deal of pain at first and the mother did not soon get over the dread that the pain occasioned. It was remarkable how common this condition was. For many years she had made it a practice when examining young girls for other conditions to notice the nipples without telling them that she was doing so and when she found this condition she suggested treatment in order to avoid the future trouble if these girls married and bore children. She thought that this condition was caused by the pressure of the corset bone against the nipple; in most corsets the bone came directly under the nipple and bevelled the side of nipple the result of this was very serious and the manufacturers of corsets should be informed of the danger of the bones as now placed, and young women should be advised to remove such bones. In the course of routine examination the pediatricians might have opportunities to note whether the nipple was inverted and to advise early attention to the condition. Enlarged breast glands might result from infections absorbed from an accumulation of secretions from the skin which became lodged in the nipple depression.

DR. CONWAY A. FROST of Utica said that the object of his paper had been to emphasize the desirability of keeping away from the



cow and of inquiring as to what effect nervous disturbances in the mother had on the milk and on the child; his object was not to discuss the treatment of nervous diseases in women.

#### THE VALUE OF DISCIPLINE IN THE CARE OF THE SICK CHILD.

DR. T. WOOD CLARKE presented this paper. He stated that the matter of discipline in the sick child was one of not small importance to the physician. Upon the control of naughtiness not infrequently depended the success or failure of one's efforts toward diagnosis and cure. They were all familiar with the hopeless feeling that took possession of one when on entering the nursery he was greeted with a howl of fury and a series of acrobatic and pugilistic activities. It was a very easy matter to overlook a soft heart murmur, or some early sign of pneumonia or tuberculosis, in an examination accompanied by outlandish shrieks. The need of a certain amount of discipline in the bringing up of a child and the adoption of definite rules which must not be broken were too well accepted facts to require discussion. There was little difference of opinion as to the healthy child's need of restraint. When the child was ill the attitude toward him usually changed, and he obtained more freedom of action. This was especially true if there was a prospect of a long illness. The result of such a course, however, was disastrous, for the young autocrat, learning that whatever he wanted would be given, immediately became dissatisfied with what he had and turned his mind to the discovery of new wants to be gratified. If he did not get what he wanted he made life unbearable for those about him. This unruliness acquired during illness was not discarded after recovery. At the beginning of an illness, especially if it promised to be protracted, it should be explained to the parents that it was necessary that strict military discipline be maintained; if such a course was carried out the life of the family would be easier during the illness, the work of the doctor would be lighter, and, most important of all, the days of suffering will be happier for the little patient. The child must be taught in one way or another that the word of the parents, the doctor, and the nurse, were even as the laws of the Medes and the Persians, and that teasing and yelling were useless wastes of time, and a burst of temper would avail nothing besides some experience highly incompatible with bodily comfort. Dr. Clarke cited a case to illustrate the point that lack of discipline might be directly responsible for actual illness, and described the method that he employed to gain supremacy over the refractory child and to effect a cure of the illness. Before beginning the discipline in this case he thoroughly convinced himself that there were no signs of meningitis, a possibility always to be borne in mind when a naturally good child suddenly becomes naughty. There was no more fruitful seed of adult neurasthenia, hysteria, and uncontrollable temper, than that which was implanted in childhood by lack of discipline during illness. It might save worry to humor the child for the time being,

but it probably started the child on the downward path to a neurotic temperament, which would continue more precipitately after the illness had passed and the restraining influence of the physician was lost. As to how to enforce discipline in the young child there were different opinions. Occasionally bodily chastisement had to be resorted to; sometimes calmly ignoring the fit of temper would be effective; sometimes deprivation of a pet privilege served the purpose. The method with which the writer had had most success was that referred to above, namely, suppressing the scream with the palm of the hand. The scream was the child's only effective weapon when he wished to accomplish his end; if used with enough will it usually obtained its way. Take away his scream and the child was powerless to resist. There was no pain associated with this procedure. It was not cruel or dangerous. Do away once for all with that pernicious admonition to the parents "Your child is nervous; he must not be crossed."

#### DISCUSSION.

DR. GEORGE DOW SCOTT believed that the personality of the doctor with absolute honesty toward the child was of more importance than severe measures. This applies to a sick but spoiled child. A certain calm mastery toward a child is necessary on the part of the parent or physician but absolutely no brutality is permissible. Parents teach children to fear the doctor by telling them if naughty he will take them away in a bag, kill or maim them, etc. Honesty of purpose disciplines a rebellious child.

MR. HERBERT WEET, Principal of the Rochester Schools, said that there were some points brought out in the paper that were quite as vital to the teacher as to the physician. The paper had been essentially a plea for self control for the growing child and the point had been made that this was for the welfare of the child. If that was true of the physical it was even more true of the mental and the moral. The problem of self-control was the one that so greatly concerned the elementary teacher. Education was essentially the training of the child in self control and similar qualities. The fact that these elements in education seemed to hold a subordinate place to mere book knowledge was due to the fact that the community demanded that the children be able to pass examinations. The child acted and developed through the four instincts of play, curiosity, imitation, and repetition. There could be no growth or development except as there was opportunity for the expression of these instincts. The great problem of education had been that of discriminating intelligently between the instinctive tendencies which should be developed and those which should be suppressed. This was the problem upon which the Montessori and Froebel methods were founded. Elementary education should bring out and develop self control; honesty, frankness and simplicity and real instruction was one of the means to that end. The committee of investigation in New York in its examination had not ignored the value of tests of ability to pass judgment and to take initiative.

DR. T. WOOD CLARKE of Utica agreed with all that Dr. Scott had said, and that he was not brutal; the cases cited in which he had suppressed the crying were exceptional cases. He certainly agreed with Dr Scott on the point of the necessity of implicit honesty in dealing with children. His method of suppressing the cry did not hurt the child in any way.

#### CARE OF THE NEW-BORN.

DR. C. G. LEO-WOLF, Niagara Falls, N. Y., read this paper which brought out nothing new but emphasized the following important but frequently neglected points. (1) The feeding of the new-born should be in the hands of the pediatrician from the very first. The infant should be fed not at all on the first day, once or twice on the second, three times on the third, four times on the fourth, and five times a day at four-hour intervals from the fifth day on. (2) In hospitals and among the wealthy two nurses were employed, one for the mother and one for the new-born; otherwise special care on the part of the nurse should be exercised to prevent infecting the infant with the bacteria from the lochia. (3) Wiping of the mouth was no longer practised. (4) Books on the care of infants intended for mothers and nurses should not contain any formulæ. (5) Registrars of vital statistics should be prevented from furnishing the manufacturers of patented and proprietary foods with the addresses of young mothers.

The pediatricians should get together and appoint a committee to prepare a book for mothers that would fulfill the proper requirements and which would omit what was objectionable.

#### DISCUSSION.

DR. JOHN RAGONE of Buffalo agreed with the speaker and was heartily in sympathy with his suggestion that the new-born baby should be under the care of the pediatrician in the hospitals and also in private practice where it was possible. Being an obstetrician, the speaker said that he could look at the matter from the side of the pediatrician and also that of the general practitioner. The obstetrician as a rule was not interested in the baby and the general practitioner usually gave too little attention to details. The result was that the pediatrician was eventually called in but why was he not called at first before the damage was done that was sometimes so difficult to repair? He had been following the four-hour method outlined by Dr. Leo-Wolf and had found it satisfactory. He wished to emphasize the point of the necessity of cooperation between the obstetrician, the pediatrician and the general practitioner to the end that the mother might have better care before the child was born, that she might be properly nourished after the birth of the child and that the breasts might receive proper attention. Abscesses of the breast should be regarded in the same light as stitch abscesses or in-

fectured wounds were now regarded in surgery. They should never occur. Another advantage derived from placing the child in the hands of the pediatric nurse in the hospital was that she was trained in the care of children while few nurses outside of the large hospitals in the cities were properly trained in the care of the new-born infant. They would reach their aim as pediatricians only when they knew how to care for the baby in the right way and at the right time and not in the wrong way and at the wrong time.

DR. DeWITT H. SHERMAN of Buffalo said that in order to obviate the gripes mentioned by Dr. Leo-Wolf he advised the early administration of a weak solution of bicarbonate of soda. He did this because bicarbonate of soda was one of the best mucus solvents and hence cleansed the mouth and stomach and allowed easier gastric secretion; because as an alkaline diuretic it relieved renal colic due to the early passage of uric acid crystals and their salts, and, thereby prevented the abuse of the child by locating the colic in the proper place rather than considering it as an intestinal one and resting satisfied with castor oil treatment often given in heroic and painful doses. Dr. Sherman advised putting the babe to the breast every six or eight hours during the first twenty-four hours, then a little oftener during the remainder of the time until the milk came. After that the interval should be regulated in direct proportion to the amount taken and the comfort of the child. The scales were absolutely essential as a guide in determining this interval.

He did not agree that a regular four-hour interval should be attempted in every case. It might be striven for but the amount of milk obtained and the babe's happiness should be the deciding factors. He did agree that the longer the interval the better, other things being equal, in order that the mother and the breasts might have proper rest. After cleansing the stomach with soda water he advised early feeding at long intervals of a low fat, low casein, and fair milk sugar percentage in order to avoid early undue loss of weight. He also advised an early accessory feeding once a day; in addition to giving the mother some liberty this served as a test for the child's digestive ability and forearmed one for accidents to the maternal supply.

DR. SHERMAN laid great stress on the aseptic handling of the new-born. A sterile cloth should be laid inside the blanket in which he was wrapped. In removing the vernix caseosa the oil or vaselin should be sterile. To bathe the baby the water should be as sterile as that coming from a heater and cooled. If the mouth was cleansed the nurse's hands should have been previously sterilized and sterile gauze should be used. The rectal temperature should be taken as frequently for the babe as for the mother as the temperature was an important indicator of its condition.

DR. THOMAS S. SOUTHWORTH of New York asked Dr. Leo-Wolf what disposal he made of the old idea that nursing was an assistance on the involution of the uterus. He could not quite accept the idea of the long interval before the first feeding. Could one not take a middle ground and put the child at the breast four times in twenty-

four hours during the first day? Colostrum was a natural laxative and Dr. Southworth believed this was for a purpose. To his mind the four-hour interval had not yet been proven as a necessity for all infants. On the Continent the mothers appearing at the clinics had a much larger supply of milk than they did here and their children might do well on the four-hour interval as they got all they needed. In America it was a different matter where the question of a sufficient amount of milk hung in the balance.

Dr. Clark had told of a case of remarkable amount of milk being secreted when he mentioned the woman on the Continent who nursed eight infants. This was the result of stimulation. Where stimulation was needed the four-hour interval was a mistake.

Dr. Southworth told of a case in which the mother had had a setback and the baby had been put on four feedings daily of one-half milk and one-half water. Under his advice she nursed the baby at both breasts at each feeding and the milk supply increased rapidly so that the infant got along with two accessory feedings. Something should be done with the obstetrician. A popular opinion should be created that a baby should not be weaned without a consultation with the pediatrician as weaning was a serious matter.

DR. T. WOOD CLARK of Utica asked Dr. Leo-Wolf if he had the infants nurse from one or both breasts at a feeding. If the breasts were nursed alternately there would not be enough stimulation to the mother inclined to have too little milk. If the child did not nurse during the first two days they had to give it castor oil for it got no colostrum and he was very strongly opposed to this. One author had claimed that this practice was responsible for constipation in later life and while he would not like to go as far as that he did believe that it broke up the natural rhythm of the body which it took a long time to reestablish. He preferred to use a glass rod oiled rather than to employ the castor oil scrubbing brush. He thought that when the milk seemed to be insufficient that the infant should be put to the breast every two hours and instead of giving accessory feedings to give supplementary feeding after the child had obtained all it could from the breast.

Dr. Clark asked what progress the Society for the Prevention of Infant Mortality was making in the preparation of the book for mothers.

DR. SHERMAN replied that they were working on the book and it would be a model one; it was entitled "Saving the Baby."

DR. CARL G. LEO-WOLF had not mentioned castor oil because he did not use it. He thought the suggestion of giving bicarbonate of soda very valuable. He was not a faddist on the four-hour interval but had found that the plan worked well with most babies; of course, he would not use this plan for a premature baby. The supply of milk was regulated by the demand and it took some little time for the mother and child to adapt themselves to one another. It was sometimes as long as six weeks before the mother's milk supply was thoroughly established. He had never seen a postpartum hemor-

rhage from not putting the child to the breast; on the other hand nursing greatly increased the after-pains.

DR. FRANK VAN DER BOGERT OF SCHNECTADY read a paper on

#### ENURESIS AND CHRONIC DIGESTIVE DISTURBANCES.

Although cures of incontinence are not infrequently noted following the removal of sources of local irritation, the fact that these same local conditions occur with even more frequency in cases which are not bed wetters, and the frequent failures following treatment directed toward these lesions, must make us exceedingly sceptical as to their very great etiologic importance.

With the exception of a comparatively small number of cases in which there is found an extreme state of acidity or alkalinity, cases in which evidence of a true cystitis are found, and the exceedingly rare cases of diabetes in childhood, the infrequency with which changes in the urine are found apparently warrants a certain disregard of the irritating properties of the urine in the production of the symptoms.

Whether we attribute the condition to local reflex disturbances or to changes in the urine or whether we believe it to be due to thyroid insufficiency, to deficiency in the suprarenals or that the enuresis is sometimes caused by an alteration of the hormone of the kidney, it seems fair to consider these factors as more direct and exciting causes and to look deeper for the underlying cause of the excessive response of the nervous and muscular mechanism and for the derangement or poor development of the organs accused.

Since the functional nervous disorders of childhood so often apparently depend upon chronic digestive disturbances, the histories and symptomatology of fifty children, subjects of incontinence, were studied with a view to determining to what degree disturbances of the digestive tract might be held responsible.

The belief that disturbances of digestive functions play an important rôle in the causation of enuresis, other than through the production of changes in the urine, is based upon the following facts brought out by the study of the above series of cases.

The symptoms occur at an age when gastrointestinal disorders are most common and productive of most nervous symptoms.

The dietetic histories of the children examined showed invariably gross errors, principally excesses in starches and sweets.

The incontinence practically always occurred along with other functional nervous disorders, or with local digestive symptoms, or with a poorly nourished state and anemia.

The frequent occurrence of adenoids may, the author thinks, be justly considered part of the digestive catarrh, and the relapses occurring during and after the catarrhal diseases together with the relapses following grosser dietetic errors and during acute digestive upsets must be considered incriminating.

The treatment, based upon this theory as to causation, must be that of the gastrointestinal condition.



## DISCUSSION.

DR. DEWITT H. SHERMAN said that the principles elucidated by the reader of this paper impressed him as striking at the root of the cause of nocturnal enuresis. A child with a comparatively stable nervous system might have adenoids, adherent prepuce, intestinal parasites, etc., and yet have good control of the sphincters. The building up of the general nervous and physical tone and the removal of the various reflex influences should produce permanent improvement. In spite of these measures some children still continued their bad habits. To many of these he first shyly resorted to psychotherapy with startling results. After gaining the confidence of the child, the physician was the one to make the greatest mental impression. It might take time but suggestion worked wonders. The physician need not be called upon if the parents had sufficient force of character to make the so-called "night suggestion" and do it well. It seemed particularly adaptable to the nervous high-strung child especially if he was a good patient. He agreed that adenoids belonged more to the class of catarrhs of the gastrointestinal tract and could not see how the administration of thyroid extract could be followed by any immediate startling effect.

Dr. Sherman cited a number of cases that were very convincing as to the value of suggestion in his hands.

DR. R. D. MOFFETT of New York said that some of the foreign physicians thought that these cases of enuresis were mentally defective. Many of them were neuropathic and responded easily to suggestion. Many of them had chronic intestinal indigestion and one had to use other means besides suggestion. The faradic current had been used by applying it over the sacrum and bladder; this had been done abroad and a number of cases were found to respond to this treatment.

DR. HERRMAN said that the majority of these cases represented purely functional neuroses. There had been about twenty different methods of treatment used by different physicians and with entirely different results. If there was any great bodily change suggestion would not work. Occasionally such changes were present but most of the cases were only functional neurosis. As to the association of adenoids and enuresis, he wished to remind them that about 25 per cent. of all children had enlarged adenoids and hence this association was not surprising. He had tried thyroid but had not obtained any very brilliant results with it. He had had a large number of cretins under treatment, many of them had enuresis and he could not see that the thyroid had any effect upon the incontinence. Frequently intestinal symptoms were present and if the author of the paper was correct in his interpretation of the association of enuresis and chronic intestinal intoxication, it was important to learn of it, as anything that would help to build up the general condition would assist in overcoming the enuresis. Perhaps one reason why the enuresis improved during the summer was that most of these children being nervous were influenced by the long hours in school

and that being out of school and out of doors made the difference.

DR. FRANK VANDER BOGERT said that Dr. Van der Veer of Albany had said that in a large number of cases of adenoids coming under his observation only 10 per cent. had enuresis.

#### A PLEA FOR THE MORE FREQUENT USE OF LUMBAR PUNCTURE.

DR. EDWARD J. WYNKOOP of Syracuse stated that his reason for presenting this paper was to secure the cooperation of his hearers in bringing this procedure into more common use. He referred in this paper to conditions other than true meningitis and left out the use of lumbar puncture in dealing with epidemic cerebrospinal meningitis and those inflammatory conditions caused by the pneumococcus, influenza, or tubercle bacillus.

There was as yet on the part of the large majority of the profession a hesitancy about attempting to do lumbar puncture and they did it only as a last resort. The thought of puncturing the spinal membrane seemed a difficult feat and hence this important means of diagnosis and treatment was neglected. It had been demonstrated by Quinke and others that puncturing the spinal canal in the lumbar region was not only comparatively safe, due to the separation of the ends of the cord and the condition of the vertebral arches and spinal membranes, but fairly easy in the average case. Care should be taken that the patient was in the proper position and the spine well arched so as to give as much space as possible between the vertebræ. During the past few years he had seen some cases which presented symptoms of meningeal irritation sometimes alone and sometimes accompanied by other diseases, as some of the various infections. In these cases, while one or two of the symptoms of true meningitis were lacking, there was sufficient evidence of irritation to make one feel that a diagnosis was better made after a lumbar puncture had been performed. In every instance lumbar puncture was advocated and in most cases the request was granted. In almost every case the fluid withdrawn was clear, coming out usually under pressure, yet microscopically it showed no pathological elements.

In almost every instance the meningeal symptoms abated after a few hours and did not return. While most of these cases developed one of the infectious diseases, yet the meningeal symptoms cleared and stayed cleared and the feeling as to any uncertainty of the possibility of a true meningitis developing was at once relieved.

The amount of fluid withdrawn depended upon the amount of pressure present but was always enough to secure a sufficient quantity for laboratory purposes. In such cases lumbar puncture should be done at once both for diagnostic and for therapeutic purposes. There was a certain type of children who developed convulsions and showed terrific nervous involvement at the least provocation; it seemed that some of these might be cleared up if a lumbar puncture were attempted more often and the spinal fluid subjected to repeated examination. Practical experience had shown that convulsions occurring late in infectious diseases, such as whooping-cough, were

frequently immediately relieved by lumbar puncture. It was not his thought to discard drugs in this type of cases but it seemed to him that the relief of brain pressure was easier, surer, and safer by lumbar puncture than by any other means.

#### DISCUSSION.

DR. WALTER LESTER CARR of New York presented the following discussion, which was read by the secretary. Lumbar puncture was now so firmly established that it was used in hospital work more often than paracentesis of the chest and abdomen. The conditions for which lumbar puncture was performed were: 1. When there were evidences of pressure symptoms occasioned by changes in the brain or spinal cord. 2. When it was deemed advisable to study the character of the fluid in the spinal canal so as to detect pathological changes. 3. When any substance was to be injected for therapeutic purposes. In meningococcus meningitis drainage relieved pressure symptoms, even when antitoxin had been administered. Lumbar puncture should be done more often in children suffering from the effects of cerebral concussion and other brain injuries. These uses of lumbar puncture should be extended to private practice, for with ordinary surgical cleanliness there was no danger to the patient. Local or general anesthesia was not required in infancy, but in childhood a local anesthetic might be applied, or ethyl chloride inhaled. The physical, chemical, cytological, and bacteriological characters of the spinal fluid might be of supreme value and symptoms now designated as meningism might be classified.

DR. JOSEPH ROBY of Rochester said that with regard to lumbar puncture he wished to ask if any of them had ever seen a case of anaphylaxis. In a case of tetanus he was giving an intravenous injection which was rather difficult because the man was in constant convulsions. Immediately upon giving the injection the man succumbed. He wished to report another case, one of cerebrospinal meningitis in a child that had previously been healthy. The child was four months old and he had done a lumbar puncture and found the fluid cloudy. He then injected the serum, the child breathed badly, gave a few gasps and died. It had been breathing all right before. The fatal result might have been due to a change in the pressure. Whether it was due to anaphylaxis or the change in pressure he did not know.

Dr. Roby had done a case of lumbar puncture a few days before in a child 8 years of age, which had been in convulsions from two o'clock in the morning until eight. The convulsions were more like hysteria. The temperature was 101 and pulse 110. There was no Kernig sign, the reflexes were not exaggerated, and the neck was not stiff. He thought at first that he would not make the puncture. Later he was called again and found that the child's temperature had gone up to 103. He tapped the child and the fluid came away clear. It contained no organisms though he did not look for tubercle bacilli. The urine was normal. After the puncture the temperature

dropped. There was an increased white cell count. Dr. Roby asked whether hysteria would cause spinal pressure and an increase in the leukocyte count.

DR. T. WOOD CLARKE of Utica had had a baby die just as Dr. Roby had described only he had not yet introduced the serum.

DR. EDWARD J. WYNKOOP asked Dr. Roby if he had had the fluid examined.

DR. ROBY replied that the fluid had been examined and the child had meningitis.

DR. WYNKOOP said that the fluid should be drawn off rather slowly and that two or threeappings might be employed. He had had no such accidents in his experience. When there was an infection such as pneumococcus and one was liable to have a very severe illness and where there were meningeal symptoms, if one did a lumbar puncture there would be no meningeal complications.

#### A CASE OF ANOREXIA NERVOSA IN AN INFANT.

DR. NORRIS G. ORCHARD of Rochester reported this case. The child which had apparently been doing well, was given a new nipple on the feeding bottle and refused to take food. He persisted in this refusal until he had lost about three pounds and in spite of every effort to coax or starve him until he would eat. At length gavage was instituted and carried out for several days when the child again began to eat in a normal way.

#### DISCUSSION.

DR. SHERMAN of Buffalo related the case of an infant which refused food and finally died but he had not dignified the trouble by the name of anorexia nervosa.

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## BRIEF OF CURRENT LITERATURE.

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#### DISEASES OF CHILDREN.

**Subaortic Stenosis.**—H. Thursfield and H. W. Scott (*Brit. Jour. Child, Dis.*, 1913, x, 104) record the autopsy findings in such a case. A boy of fourteen years, while seated at work, fell from his seat and died soon after. Seven years before this he had a loud systolic murmur heard over the whole precordia with the point of maximum intensity in the second right intercostal space. This was then supposed to be due to patency of the ventricular septum. The right side of the heart was moderately dilated, the auricular wall somewhat thickened. The left auricle was greatly hypertrophied. The left ventricle was enormously hypertrophied and considerably dilated. The aortic orifice was narrowed by a fibrous ring situated on the septum ventriculorum immediately below the undefended space and extending over the posterior aspect of the mitral aortic cusp. The

diameter of this ring at its widest was less than a quarter of an inch; its edges were smooth and free from vegetations. The aortic semi-lunar cusps were thickened and the two coronary cusps fused into one, so that the orifice was much narrowed. Immediately above the non-coronary cusp was a thin line of fibrous thickening in the wall of the sinus of Valsalva; and at the level of the ductus arteriosus, which was closed, was a transverse line of thickening, which appeared to have produced a slight narrowing of the lumen of the aorta. In the Hunterian Lectures of 1909 Keith mentions only four hearts with this lesion. It is obvious from the descriptions given that the condition is not incompatible with good general health, at any rate when it is present only in a slight degree, and so long as there is no infection of the abnormal structure or of the valve. It affords a probable explanation of no inconsiderable number of those cases of congenital heart disease, who, without cyanosis or clubbing of the fingers and with good general development, have a loud rough systolic murmur heard at its maximum down the sternum. Such cases are not very uncommon among London school-children, and are detected in the course of routine examination, not by reason of any failure of health.

The physical signs which we should expect to find in such a case are (i) evidence of an hypertrophy of the left ventricle; (ii) a loud systolic murmur with its maximum intensity in the second and third intercostal spaces on the right side, and conducted down the sternum; and (iii) a systolic thrill, most marked in that area. It is, however, remarkable that the thrill is recorded in only one of the four cases noted.

**Management of Breast-feeding.**—E. Pritchard (*Arch. of Ped.*, 1913, xxx, 164) says that meconium subserves the definite function of an intestinal lubricant, it protects the delicate mucous membrane from damage or friction due to food or foreign material which finds its way into the bowel, and pending the advent of the normal constituents of the infantile stool it affords the bowel wall a suitable substitute on which to practise its normal functions. In view of the important physiological function of meconium, it should never be expelled prematurely by castor oil, nor by any other aperient, and if accidentally dislodged it should be replaced by an efficient substitute such as petroleum emulsion. Keep the mouth clean by the physiological method of preserving an intact mucous lining rather than by cleaning out the mouth with a linen rag or other coarse material. From birth onward the system of four-hourly or three-hourly feedings offers great advantages provided the total quantity of food consumed is checked by the "test-feed" and found to conform to physiologic requirements, and provided, also, nutrition is well maintained. If the quantity of milk consumed falls short of normal standards, it must be made good by supplementary feedings from the bottle. In applying the "test-feed" the mother nurses after a three-hour interval, the baby being accurately weighed before and after nursing, the difference indicating the amount of milk consumed at a feeding. The teaching of the "test-feed"

when systematically applied shows that, as far as London children are concerned, the amount of breast milk they secure is enormously below the usually accepted estimates, a fact which suggests many modifications, not only in method of conducting breast-feeding, but also, in a quantitative respect, in our method of artificial feeding. From a qualitative point of view the character of the proteid bodies contained in milk are most important; these cannot be recognized otherwise than by their physiologic effect on the infant. It must be remembered that an infant requires time to learn to digest a new food and that therefore new foods should only be given at first in very small amounts or in a predigested form.

**Free Aponeurotic Graft in Operation for Spina Bifida.**—Gino Pieri (*Ann. de méd. et chir. inf.*, Feb. 15, 1913) gives a new method of obtaining tissue sufficient to cover the deficiency in spina bifida. He has operated successfully in two cases, both of which are now living. In one case hydrocephalus developed a few weeks after the defect was closed. One infant has had two deficiencies closed, one at the coccyx and one at the beginning of the dorsal region. The closure of the uncovered space is easy when there is a pedunculated tumor, but in sessile tumors it is most difficult to obtain material enough to permanently close the openings. A regeneration of the planes of the skin and subcutaneous tissues should be attempted. The author makes an elliptical incision in the skin and subepithelial serous zone, and resects it down to the spinal cord. He brings these together, and then cuts from the external surface of the thigh an elliptical piece 5 by 2 centimeters in size, cutting down to the muscles themselves, and removed all the tissues together, skin, cellular tissue, and fascia lata. This is grafted over the opening of the spinal canal, with silk sutures uniting each layer. A perfect result was seen fifty days after the operation, in the first child, but there was considerable hydrocephalus. The same procedure was undertaken in another case in the cervicodorsal region. There was a pedunculated tumor the size of a nut and in the sacral region another sessile tumor. In this case also the operation was successful and the child has no hydrocephalus at present. The idea of the transplantation of the aponeurotic tissues to cover the opening in cases of spina bifida has thus been practically demonstrated. Its advantages are that free aponeurotic grafting is possible in cases in which mobilization of the bones and muscles is impossible; the technic of this operation presents no difficulties or dangers either in the region from which the graft is taken or where it is placed. The aponeurotic graft preserves its vitality, and it does not matter if the skin graft does not grow.

**Semeiology of the Cerebrospinal Fluid.**—F. Rathery (*Ann. de méd. et chir. inf.*, March 15, 1913) says that we can obtain from the examination of the cerebrospinal fluid important knowledge of both local and general conditions in the body. Every modification of the metabolism is shown in the composition of the cerebrospinal fluid and an explanation may be gained from it of certain general and dyscrasic nervous manifestations. The fluid probably is secreted



from the choroid plexuses and the intraspinal circulation is maintained through minute openings in connection with the nerve fibers and the lymphatic spaces of the nervous tissue. The modifications of the cerebrospinal fluid in various diseased conditions are affected by mechanical factors, such as obstruction of the circulation, and by inflammation. The fluid becomes changed in contact with an inflamed brain surface in its histology, its content of blood cells, leukocytes, and microbes. Important chemical changes also occur in disease. Physical signs, as the force with which the fluid flows out of the puncture, have diagnostic importance; the color may be reddened by blood cells, or become deeply yellow. It may become turbid with pus or leukocytes, showing the presence of ordinary meningitis, an abscess, or cerebrospinal meningitis. Its density and viscosity are important. The chemical elements that may be altered or present abnormally are albumin showing an organic lesion, especially inflammation, and hyperalbumose in meningeal inflammations. Its presence differentiates between organic and functional diseases. It is also increased in general diseases of infectious nature. Not only the amount of albumin but also its nature is important. Serine is especially increased in tuberculous and cerebrospinal meningitis, while globulin is increased in syphilitic and parasymphilitic affections. A negative test for globulin eliminates syphilis, while a positive reaction is not a positive evidence of that disease. The amount of urea present in urine is increased in uremia, and the larger the amount present the graver the prognosis. Sugar is increased in hyperglycemia, intoxications, infections, and in meningeal congestion; it is diminished in meningeal hemorrhage and meningitis. The amount of hyperglycemia is in relation with the severity of the septic condition and assists in the diagnosis between meningitis and meningism. Acetone may be found in the fluid; chlorides are lessened in inflammation, especially in tuberculous meningitis. The histological study of the fluid is most important; red cells, polynuclears and lymphocytes vary. Red cells are present in hemorrhage; polynucleosis means acute inflammation of the meninges; lymphocytosis indicates a chronic inflammation; it is constant in tuberculous meningitis. When convalescence begins it changes to lymphocytosis, and this change has important prognostic value. In syphilis lymphocytosis is frequent, both in hereditary and acquired disease, in the secondary or the tertiary stage. Bacteriological examination may demonstrate tubercle bacilli, the bacillus of Weichselbaum, of Eberth, of Loeffler and colon bacilli. Cultures and inoculations are also of value.

**Rickets in the New-born.**—M. Kassowitz (*Jahrbuch. f. Kinderheil.*, Bd. xxvii, H. 3, 1913) contends that the same bony changes that are found in rachitis in children of two to three years of age may be present at birth, and that he has demonstrated the changes in the ends of the bone by histological examination of the bones taken from children soon after birth who have died from other causes. These changes are found in the bones of the skull and periosteal covering of the ribs. He made sections of the ribs in forty-eight perfectly

developed new-born children. The histological changes found are described in detail. The author sums up by saying that they are so similar to those found in rachitic children of later age that we must suppose that they were caused in both cases by the same troubles. The congenital weakness of the sutures and fontanelles in the new-born are due to the same changes as in rickets of the older child. These changes differ from those found in cases of congenital syphilis to such an extent that the author contends that it is impossible to believe that they were the result of congenital syphilis. He claims the great value of these researches to the new-born child in the matter of diagnosis, which permits the proper treatment for rickets to be begun as soon as the diagnosis is made. Children born with thinned skulls and rachitic rosary should be at once put on antirachitic treatment so as to produce consolidation of the bones and closure of the skull at the normal time. Lime and phosphorus are indicated, with the best of hygiene, plenty of fresh air, and a diet containing lime.

**Coxa Vara.**—J. W. Sever (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 405) says that rachitic coxa vara is a frequent and concomitant condition of bow legs and knock knees, but may exist independently. In the writer's series of cases it was observed to a greater degree in knock knees than in bow legs. The condition apparently requires no treatment. The correction of a coexisting condition of knock knees or bow legs may hasten the process of recovery from coxa vara. In all cases there is a tendency to spontaneous recovery and a restoration toward the normal angle of the neck of the femur without treatment, and with no cessation from use or weight bearing. There is probably very little or no permanent disability in the average case.

**Changes in the Mineral Constituents of the Body in Rickets.**—Curt Meyer (*Jahrbuch f. Kinderheil.*, Jan., 1913) says the symptoms of rickets may begin as early as the fourth month. In breast-fed children who acquire rickets the disease occurs later than in the bottle-fed infant. Five infants served as material for research for the author. He finds a marked lack of balance in lime and phosphorus, while alkalies, chlorides, and magnesia were well retained. With almost normal retention of nitrogen the deficiency of phosphorus was great.

**Eczema Oris as a Manifestation of Congenital Syphilis.**—L. Findlay and H. F. Watson (*Lancet*, Mar. 29, 1913) write of a skin lesion which they ascribe to congenital syphilis and designate eczema oris syphilitica. They have collected twenty-one cases. In its most typical form the lesion is situated at one or both angles of the mouth and radiates therefrom toward the cheek, sometimes in the form of fan-shaped patches. It may, however, completely surround the mouth and implicate the face extensively. The patches are somewhat irregular in shape with sharply cut or ill-defined margins. They are red in color, at times the hyperemia being very marked. The surface is, as a rule, dry and scaly, although occasionally, and especially during an exacerbation, there may be some discharge with

the formation of crusts, and at this period there is always a certain degree of induration. The eczematous patch is continuous with, and frequently invades, the mucous membrane of the lip, giving it a slightly papillary appearance. The lips themselves may be swollen to a greater or less degree. A similar condition round the nostrils, where there is usually a greater tendency to moisture, and eczema tarsi, are also present in a proportion of the cases. It is a most obstinate and chronic malady, never entirely disappearing, though varying much in severity from time to time. The patients do not as a rule present any specific stigmata, and the proof that the lesion is of a syphilitic nature rests on the presence of a positive Wassermann reaction and on the result of anti-specific treatment. The diagnostic features on which the writers lay most stress are the chronicity, but more especially the situation of the lesion at the angles of the mouth with implication of the mucous membrane of the lips. A review of the literature inclines them to the opinion that this condition has usually been classed along with pityriasis sicca, seborrheic dermatitis, scrofulous eczema and tuberculous eczema, and, except for its localization, and perhaps also its persistency, one could not differentiate it from these other varieties of skin disease.

**Complement Fixation Test in the Management of Gonococcus Vulvovaginitis.**—A study by G. G. Smith (*Amer. Jour. Dis. Child.*, 1913, v, 313) of twenty-five cases of vulvovaginitis by means of the complement fixation test shows that the test was positive in eleven out of twelve clinically positive cases, and in four cases in which the evidence was inconclusive. It was negative in three cases in which other evidence of cure was insufficient, but in seven others the clinical findings were corroborative. For the purpose of establishing a cure, the test is of considerable value.

**Influence of Operative Pneumothorax on the Respiratory Mechanics of the Child.**—R. P. van de Kastele (*Monatschr. f. Kinderheil*, Bd. xi., No. 11, 1913) has observed that in cases of tuberculosis of the lungs in which operative pneumothorax had been produced on the first day there was an abnormal type of respiration. He investigated the effect of the entrance of oxygen into the lung cavity in children, making use of seven children who had undergone the operation. He gives a short review of the work that has already been done in this direction. The children examined were from two to fourteen years of age. He finds that in children operated upon the breathing is more rapid, less deep, and less ample than Gregory found it in his normal cases examined. The author questions whether these changes were entirely due to the operation. The lungs are compressed within the pleural cavity by the air. The increased frequency of respiration is in the nature of compensation for the absence of respiration in one lung. The pressure within and without the thorax are equalized and the therapeutic action of the oxygen introduced is useful.

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